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RICHARD P. ROTHWELL, C. E., M. E., Editor.

ROSSITER W. RAYMOND, Ph. D., M. E., Special Contributor.

SOPHIA BRAEUNLICH, Business Manager.

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The Colar gold field in India has shown a steady growth, its output having nearly doubled in four years, rising from 104,932 ounces in 1890 to 207,135 ounces in 1893, making it a factor of some importance in the general gold supply. The mines of this district are in the hands of five companies and appear to be carefully managed. The ores are not refractory and are worked without much difficulty.

The result of the great strike of the coal miners in England appears in the announcements of the January dividends of the English railroad companies. Comparing them with last year we find that the Great Western, which suffered least of all, drops its dividend rate from 6 1/2 to 5 1/2 per cent.; the Lancashire & Yorkshire falls from 4 to 3; the Great Northern from 5 1/2 to 3, and the Midland from 6 1/2 to 3 per cent. The smaller companies make quite as bad a showing. The London & Northwestern has not yet declared its dividend, but was a heavy loser by the strike.

The Scotch coal owners and ironmasters did not suffer so much as the English during the great coal strike last year. The price of coal went up too high for its economical employment in pig iron manufacture, so the ironmasters who were also colliery proprietors curtailed their iron output and sold their coal on the open market. Consequently, their profits during 1893 have exhibited little decrease. For example, Merry & Cuninghame, makers of the Carnbrae brand of Scotch pig iron and who are also colliery owners, have just paid a 10 per cent. dividend on their ordinary stock for the year 1893.

The estimate of the new rails required for the German State railroads—which include nearly all the important lines in that country—for 1894 is 122,500 metric tons, which seems a small quantity for their supply. There is, however, very little new construction in hand at present, and the German rail mills do not seem to have before them the promise of much activity this year, unless they can secure some export orders. Last year about 130,000 tons of rails and track material were exported. It is to be noted that among the requirements of the railroads for this year there are included 54,635 tons of steel ties, showing that the use of metal substructure is extending considerably.

It is announced that Guatemala has defaulted in the interest on its bonds "on account of the heavy decline in the price of silver." Our single-gold-standard English cousins, after a few more Indian experiments, a few more failures of silver countries to pay interest or principal of their English loans, and a few more months of declining export trade to silver countries, will, no doubt, begin to understand that it is the universal creditor and manufacturer that will suffer most from the decline in the value of silver, due to its exclusion from the full tender money of the world. When this lesson is impressed a little more deeply by the inexorable "logic of events," England will probably want her interests protected by having a universal bimetalism adopted.

**THE PRODUCTION OF LEAD IN THE UNITED STATES.**

The production of merchantable lead in the United States in 1893, though not so great as in 1892, was still much greater than was anticipated, or than our preliminary reports indicated. The total amount of merchantable lead, that is of refined desilverized, or soft or non-argentiferous and of antimonial lead, that was produced in the country in 1893, was 195,948 tons of 2,000 lbs. Of this amount, 130,026 tons were refined desilverized, produced from ores mined in the United States, 31,369 tons were of soft or non-argentiferous lead, and 5,283 tons of antimonial lead, making a total from United States ores of 166,678 tons. Besides this, 29,270 tons of refined desilverized lead was produced from imported ores, mostly Mexican, smelted in this country. Our smelters, therefore, produced 195,948 tons on the assumption that the stocks of base bullion remained the same throughout the year. As, however, they declined and the refiners worked down a portion of their stocks, the amount actually produced by the smelters, and still more by the mines, in 1893, declined much more than did the amount put in final merchantable form by the refiners.

The total amount of such merchantable lead produced in the past four years was as follows, in tons of 2,000 pounds:

	Desilverized.	Soft.	Antimonial.	From foreign ores.	Total.
1890.....	106,066	31,103	4,896	18,124	160,190
1891.....	138,749	32,897	5,105	21,162	197,913
1892.....	145,217	31,655	5,805	26,794	209,471
1893.....	130,026	31,369	5,283	29,270	195,948

In addition to this 35,000 tons of foreign bullion was refined here in bond in 1893, and was exported.

These statistics have been compiled and revised with the greatest possible care, each producer giving his production with minute detail. They are given with further details and with distribution to sources where mined and with much other valuable information connected with the subject in the forthcoming volume of the "Mineral Industry."

## LAKE SUPERIOR IRON ORES.

While the report of a large contract for Mesaba ores at \$2.75 per ton of 2,240 lbs. at Cleveland, O., does not seem to be confirmed, there is little doubt that the prices of Lake Superior iron ores will be lower this year than they were last season or at any previous time. The other ranges, while they anticipate some sharp competition from the Mesaba, do not seem disposed to give up, and are already preparing for the opening of navigation.

In an interview lately published in the Chicago "Tribune," Mr. Bacon, President of the Minnesota Iron Company, gives average cost of putting iron ore from the Mesaba at a lower lake port as follows: Royalty, per ton 40 cents; haul to Lake Superior ports, 80 cents; lake transportation, 90 cents; cost of mining, 50 cents; commissions, insurance, etc., 15 cents; total, \$2.75. He estimates that the Vermilion range mines are quite prepared for the competition, and that while the older mines on the Marquette and Menominee ranges have a higher cost of mining, they have some offset in a lighter freight charge from the mines to the shipping port. He believes, however, that only the most economically worked mines can stand the competition.

Mr. Bacon, it may be added, in the interview quoted, expresses himself to the effect that the Lake Superior miners have no reason to fear the competition of foreign iron ores, should the duty be removed. The Cuban ores, he thinks, would find a market only in a very limited district near the coast, which the Lake ores do not now reach.

Mr. Bacon's figures for Mesaba ores are accurate and can be reduced only in freights on railroad and lake which together might be decreased 50 cents a ton without reaching actual "cost." We doubt very much if the Vermilion mines are as well able to stand this competition as are some of the mines in the old Michigan districts, but unquestionably the railroads will make freights from the several districts such as will enable all to work and the unquestioned advantage of the Mesaba will inure to the railroads rather than to the makers of pig iron.

## THE PRESENT SITUATION.

As the year gradually advances toward spring signs begin to multiply that the long depression which has affected our industries is gradually drawing to an end, and that the period of failure and liquidation is nearly over. As our news columns and market reports show, the closed mills and factories are beginning to re-open, while those which have continued at work are extending their operations, and preparing for a season of prosperity and increased demand. Those concerns which are most favorably situated and are able to work most economically are naturally the first to respond to the call, but others are also feeling the influence. Prices do not as yet show any material improvement, but that is due to the fact that in most departments the demand does not yet exceed the capacity of the most economical works which are willing to accept low living prices to keep running. As the demand exceeds their capacity higher prices must be paid to induce other works to start up. In most departments, stocks of material are very low, and any increase in business activity must be quickly followed by an increase in current output. There is a growing disposition evident among manufacturers to take advantage of the low prices and to supply themselves with new material, and thus secure the full measure of profit possible from the rising market, which seems not very distant though not yet here.

The iron trade, which is, either directly or indirectly at the base of all the trades and industries, has been often referred to as a trade barometer, and the comparison is not an unapt one. Just now it is showing in a marked degree the conditions to which we have referred, and the demand for and the production of raw iron and steel are steadily increasing. We hear from various quarters of furnaces blowing in, steel works starting up, and of an increased output, all of which seems to be taken up by manufacturers. New construction in various departments has already been begun, or is ready to be begun, which will require a large amount of iron and steel, while the railroad and other interests are extending purchases.

The periodic depression which overtakes this industry can in great part be explained by the conditions of modern life and business. It has been said that the increase in iron production should normally be directly in proportion to the growth in population. This is not entirely correct, since new applications are constantly found for iron and steel in replacing other materials of construction, so that the normal increase should be and is somewhat greater. The tendency of the present time, however, with continued improvements in processes and growth in available capital, is to increase production in much more than a normal ratio. This process, continued for several years, inevitably results in a surplus which cannot be marketed, and, if not in a panic, at least in a period of dullness and inactivity and low prices in which the trade must halt and wait for a time until population and demand can once more overtake it.

In our present case this periodic stagnation was at once hastened and intensified by other now familiar causes, chief among which was the general loss of confidence resulting from currency troubles and unwise financial and economic legislation. The trouble, although most intense in this country, is not confined to it, but is more or less felt all over the civilized world, as indeed any great financial trouble must be in these days of universal intercourse and trade.

The great drawback to recovery which appears to us at the present time is the continued uncertainty as to an early settlement of the tariff question. The business world can adjust itself quickly to a change in conditions, when the change is known and can be gauged and duly provided for, but it cannot measure an uncertainty. While we are still in doubt, not only as to what the new tariff will be, but also as to when it will become operative, confidence cannot be fully restored, nor can provision be made for the future. Moreover, the delay is constantly made the basis for all sorts of disquieting rumors, which are spread abroad through the press, and tend to prevent the growth of confidence in the future. Both in Congress and in the political press the questions which ought to be considered entirely with a view to the interests of the country are rather looked upon as means of gaining small partisan political advantages, and so the strife continues, to the great disadvantage of the country at large.

What business needs above all, we must repeat, is rest from the calamity howlers and certainty as to the tariff. It is important, of course, that the tariff question should be settled wisely, but it is of the utmost importance that it be settled promptly. This fact is acknowledged everywhere, and the sooner our legislators realize that prompt action in helping on a revival of industry will bring more political advantages than can any catering to special interests in the hope of gaining their assistance and this is equally applicable to both parties. If the Senate will only respond to the popular demand and take action quickly, the business recovery will proceed rapidly and a new period of growth and prosperity for the country will be inaugurated.

## NEW PUBLICATIONS.

AN OUTLINE OF QUALITATIVE ANALYSIS. By Dr. John A. Miller. New York and London: The Scientific Publishing Company. Pages 58. Price, \$1.50.

There has for some time been an openly expressed desire for some brief and concise text book of qualitative analysis in which the various characteristic reactions would be summed up comprehensively for ready reference. The value of such a book to the student is apparent. Instead of burdening the mind at the beginning with many details, not of primary importance, he has before him only those which are characteristic and are used in ordinary analyses to distinguish one element from another. This prevents waste of time in unnecessary study and, what is of still greater importance, presents the matter in such light that it is simplified and clearly before him, thus permitting a thorough grounding in the elemental part before confusing details need be treated.

Dr. Miller has displayed much ability in preparing and arranging this work; commencing with the classification of the bases, he next takes up, in a simple and clear manner, the characteristic reactions of the various elements of each group. This he follows with a description of the process of separating one element from another in the same group. After treating the inorganic bases, the acids are taken up in the same manner, and following them some of the more important organic acids. In all cases the schemes of separation are those followed in usual practice, so that any one familiar with them has a groundwork for quantitative analysis.

Such is, briefly, the outline of the work, and because of its very simplicity and systematic arrangement it would not be possible to say more without taking up the details of the various schemes. It is not possible to commend this book too highly. It seldom happens that any one so thoroughly familiar with a subject has the faculty of presenting it in concise form, and in this lies its greatest value. No student of chemistry should be without this book on his laboratory table, for there it belongs, as essential a part of his equipment as are his beaker glasses and test tubes. The book has been presented by the publishers in their usual excellent style, the paper, printing and general execution being all of the best kind.

## BOOKS RECEIVED.

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

*The Manual Training School.* By C. M. Woodward. Boston, Mass.; D. C. Heath & Co. Pages 366; illustrated. Price \$2.

*The De Kaap Annual: A Year Book of Local Information.* Barberton, Transvaal, South Africa; A. W. Bayly & Co. Pages 74. Price 1 shilling.

*The Right of Appropriation and the Colorado System of Laws in regard to Irrigation.* By Judge Harvey Huston. Denver, Colo.; the Chain & Hardy Co. Pages 334.

*Mining: An Elementary Treatise on the Getting of Minerals.* By Arnold Lupton. London and New York; Longmans, Green & Co. Pages 520, illustrated. Price \$3.

*The Foreign Commerce and Navigation of the United States for the Year Ending June 30th, 1893.* Prepared by the Chief of the Bureau of Statistics, Treasury Department. Washington; Government Printing Office. Pages 794.



## 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 Competition of Nova Scotia Coal.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: We have read with interest your article entitled "The Competition of Nova Scotia Coal," on page 122 of your issue of February 10th, and would call your attention to several errors therein. We do not think the consumer cares very much as to the cost of mining coal; what particularly interests him is the price of coal delivered at his port. Now, as the distance from Nova Scotia to Boston is practically equal to the distance from Norfolk to Boston, we presume ocean freights would be about the same. The Nova Scotia mines are at tide-water, or nearly so, while the Pocahontas mines are 375 miles from Norfolk, so that even if Pocahontas coal could be put on cars at the price you state (in which you are in error), the Nova Scotia mines have a great advantage over us, in having little or no rail transportation to their shipping port.

Your statistics as to the amount of coal imported, while interesting, we think are misleading. What Nova Scotia has been able to do in the past is not a criterion for the future, as the Dominion Coal Company will be a powerful moneyed corporation and will be able to mine coal very cheaply by improved methods; they look forward to large shipments. The amount of bituminous coal shipped by the United States into Canada, while quite large from the statistics you quote, enters via Suspension Bridge and from shipping ports adjacent, and is delivered to a part of Canada which could not be reached by the product of the Dominion Coal Company's mines.

You also state that if we take the duty off of Canadian coal the Canadians will take the duty off of our coal. In this we are quite sure you are wrong; there has been no suggestion made whatever on the part of Canada looking towards reciprocity in this respect, and we feel quite sure nothing of the kind would be done in the future. We know Mr. Wilson stated as follows: "If the United States put coal on the free list the Canadian Governor in Council would be obliged to issue a proclamation putting American coal imported into Canada on the free list." This was such an astounding statement that Col. Wm. Lamb, who represents our firm at Norfolk, telegraphed to the Hon. Sir J. S. Thompson, who is Attorney-General of Nova Scotia and Premier and Minister of Justice of the Dominion of Canada, in reference to the matter. His reply, under date of January 25th, 1894, is as follows: "There is no enactment in Canada making free admission of coal a necessary result of taking off the duty in the United States or authorizing the Governor in Council by proclamation to make coal free in Canada." It seems incredible to us that Mr. Wilson should deliberately make such a statement, which is so entirely at variance with the facts. But it is a statement so easily disproved that it is not necessary for us to go into it any further.

In regard to the coal shipped by us to Quebec, to which you refer, we would say that this was ordered by one customer for a special purpose and is not in the line of general business.

CASTNER & CURRAN,  
Agents for the Pocahontas Coal Company.

PHILADELPHIA, Feb. 17, 1894.

## The Mining District of Ocampo, Mexico.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The mining district of Jesus Maria is situated in the heart of the Sierra Madre mountains, and in the western part of the State of Chihuahua, Mexico, in the county or district of Rayon; it is 250 miles south of the international boundary line between the United States and Mexico; 225 miles due west by road and trail from the city of Chihuahua, which is the nearest point of railway communication, and from which all mining machinery and supplies have to be brought. Of this distance 135 miles is by a good wagon road, the balance by mule trail. The principal town of the district, now called Ocampo (formerly known as Jesus Maria), has a population of about 3,000 persons. The principal mine of the district is the Santa Juliana situated 200 ft. south of the main portion of the town; it is owned by an American company, whose principal office is in the city of New York. This is an old mine, the discovery of which is said to date from the year 1810. In 1833 active work was suspended and the mine allowed to fill with water, which was encountered in considerable quantities; the workings had then attained a depth of about 850 ft. Since 1833 attempts to reopen the mine have been made by various parties, but resulted in failure owing to the insufficient amounts of capital employed. Only a portion of the mine was unwatered, pillars of rich ore were taken out, and the mine was allowed to again fill with water. The present company commenced operations some 4½ years ago. The principal work done up to the present time has been the sinking of an inclined pumping and hoisting shaft on the Ronquillo shaft, the unwatering of the mine, and pushing the various levels to the south of the ancient workings. They have also run two new levels below the old works, No. 9, which is 900 ft. from the surface at the hoisting works, and No. 10, which is about 80 ft. deeper. The ore is raised to the surface through the inclined shaft from a station at the 900-ft. level by a double drum steam hoist; from the level below it is raised to the ore bin above the 900-ft. level by means of an electric hoist, of 15 H. P., supplied by the Thomson-Houston Electric Company, the power for which is generated at the company's mill, situated half a mile down the creek from the entrance to the mine. The ore after being raised to the surface is dumped into cars and transported to the sorting house placed directly over the ore bin, the fine ore passing through screens directly to the bin, the coarse ore only being sorted by hand. The ore bin is constructed in the old workings of the mine, and extends

to the level of the drain tunnel 180 ft. below the surface at the hoisting shaft; here it is again loaded in cars and transported over a tramway directly to the mill.

The reduction works of the company consist of 20 stamps and one Huntington mill, arranged for wet crushing and raw amalgamation; 10 combination pans, 5 settlers, 2 agitators, etc., driven by a 150-H. P. Corliss engine, built by the Fulton Iron Works, of San Francisco, which also drives the generating dynamo, furnishing power to the electric hoist in the mine. In connection with the mill the company has a retort house, assay office, machine and blacksmith shops. The mill and other buildings belonging to the company, including the store and buildings at the hoisting works, are lighted by a 110-light Edison incandescent electric light plant, run by a separate engine.

The ore extracted from the mine is principally sulphide of silver, accompanied by iron pyrites. It also contains native silver and gold; bromide and iodo-bromide of silver are also found, also tetrahedrite or gray copper ore in some of the ores. The direction of the vein is nearly north and south with a dip of 72° to the east. About 50 to 55 tons of ore are worked daily, yielding from 75 to 85% of their assay value. The average battery assays vary from 30 to 70 oz. per ton. Owing to various causes, the principal of which is the difficulty of handling the water in the lower level with the present pumping machinery, the monthly production has varied greatly, having been during the past from 25 to 44 bars per month. The bars contain 1,000 troy ounces each, and are about 980 fine. The bullion from this mine contains a small portion of gold, each bar having from 8 to 12 oz. of the yellow metal.

In addition the Santa Juliana Mining Company owns various other mining properties, the Santa Nino, Balvanera, Rincon, San Carlos, San Eduardo, Guadalupe and San Juan; of these the only ones now being worked are the Santa Nino, Balvanera and Guadalupe. A prospecting tunnel is being run through the Santa Nino ground, on what is called the Ronquillo vein; this has a present length of 1,120 ft., the object being to crosscut the Balvanera vein below the old workings. Work is also being pushed on the Balvanera vein, which intersects the Ronquillo vein at nearly a right angle; no ore is being extracted at present from either of these properties, only development work being done. The face of the tunnel on the Ronquillo vein is, however, in good ore.

The only other mine at present being worked by this company is the Guadalupe, situated about 1,500 ft. to the east of the town. The ore from this mine has given as high as 120 to 130 oz. per ton, battery assays, but the average will be about one-half of this. The bullion obtained from this ore has from 20 to 35 oz. of gold in each 1,000 of silver, and the production is about 10 bars per month. The Guadalupe vein is wide, the average being from 20 to 25 ft., in which there are three pay streaks of from 1 to 3 or 4 ft. in width. The course of the vein is about N. 36° west, with a dip of 55° to the S.W. The ore is extracted through a tunnel for the most part run directly on the vein. The cars deliver the ore directly to the mill, which is situated on the creek directly opposite the mine. The mill has 10 stamps, and is arranged for wet crushing and raw amalgamation. Only a small amount of ore from this mine is being worked at present, but 5 of the stamps being employed in crushing, the cause of this being insufficient boiler capacity, the mill having been designed to run in part by water power, which is only constant for a few months in the year. The above mines are situated adjacent to and surrounding the town of Ocampo on all sides. The ores in general are black sulphides, native silver and gold, gray copper ore, and occasionally bromides and iodides. They are free-milling and worked by the amalgamation yield 75 to 85% of assay value.

Of the other mines in this district now being worked, one of the most promising is the San Amado, situated in the Cerro de Santa Ana and overlooking the town and adjoining the Guadalupe claim on the northwest. The ore from this mine is similar to that obtained from the Santa Juliana. It is worked in a 10-stamp mill, situated in the principal ravine about half a mile east of the town, wet crushing and raw amalgamation being the process employed. The production is 3 or 4 bars per month, as on account of the narrowness of the vein but a small amount of ore can be extracted. This property is owned and operated by Srs. Francisco Seguirios & Sons, who also own other mining claims, situated in the same hill, and called Jesus Nazareno and La Cruz. These properties have considerable work done upon them, but are at present idle.

The Santa Eduwiges mine, situated about 1½ miles southwest of the town of Ocampo, is owned and operated by the Santa Eduwiges Mining Company, of which ex-Senator Tabor, of Colorado, and his American associate hold the controlling interest, the balance being by Mexicans residing here. This property has been in litigation for some years; recently a compromise has been effected and the company has just completed reduction works of 100 tons daily capacity. The machinery was supplied in part by the Risdon Iron Works, of San Francisco, Cal. There are four Bryan mills, and 20 stamps, with the other necessary machinery. The ore is treated raw by wet crushing and pan amalgamation. The mill is situated at El Salto, on the west bank of the Jesus Maria Creek, about 3,000 ft. east of the mine, from which the ore is delivered by means of a wire-rope tramway. The mine is operated through tunnels, the lowest of which, the present working tunnel, is 800 ft. below the crest of the hill over which the vein passes; it has a length of over 1,200 ft. The mine has been worked at irregular intervals since its first discovery in the early part of the present century, and a very large amount of bullion has been extracted. The old workings are very extensive. The ore contains free gold in addition to that contained in the silver. The mill has just been started up, so that the production can not be given at present. The course of the vein is nearly east and west, with only a slight dip to the south.

On the western slope of the same hill is situated the Refugio mine, owned and operated by the Refugio Mining Company, of Omaha, Neb. This mine is said to be on the same vein as the Santa

Eduwiges, and large amounts of low-grade ores are being extracted. The property is opened up by means of a long tunnel and an inclined shaft. Most of the ore has been extracted from above the tunnel level. The mill is situated at Rosario, about three-quarters of a mile west from the mine. They have 25 stamps, a Huntington and Griffin mills, operated by steam power, with pans enough to operate the 25 stamps and the Huntington mill, the Griffin mill being only used part of the time. Wet crushing and pan amalgamation are employed.

The ore, after being extracted from the mine, is sorted, reloaded in cars drawn by mules, and conveyed over a tramway to the brow of the hill overlooking the mill, from whence it is lowered by a wire rope tramway 3,000 ft. long. This company has been in active operation several years, and at present the bullion shipments are from 15 to 20 bars per month. The Refugio Mining Company also owns various other mining claims.

The Potrero Mining Company, an American company, whose principal office is in Chicago, owns and operates the Potrero mine, situated about two miles northwest of Ocampo. This company built a 20-stamp wet crushing mill some two years ago in the creek adjacent to the mine. At the present writing the mill is closed down and only development work is being done in the mine. This mine is said to have produced well when worked by Mexicans some years ago, but the present company has not as yet encountered any large quantities of paying ore.

The Belin mine, owned by John R. Darroch & Co., of Chicago, is situated about half a mile southwest of Ocampo. This claim has had considerable work done upon it, and a number of tons of rich ore has been extracted, which has been worked in a 5-stamp mill belonging to the company. The mill was completed last spring, and only ran about six weeks, during which time six bars of bullion were obtained. The only work now being done is the driving of a tunnel above the mill through which the ore is to be extracted in the future.

The Santo Nino mine, situated at Pinos Altos, about 6 or 7 miles north of Ocampo, is owned and operated by the Pinos Altos Bullion Company, of London, England. They have been in successful operation for quite a number of years. The property was first opened up by means of an inclined shaft over 900 ft. in depth; about 18 months ago they completed a cross-cut tunnel which strikes the vein below the bottom of the shaft and is over 3,000 ft. in length. Since the completion of the tunnel all the ore from the mine has been extracted through it and delivered on the dump at the mill. At present the grade of ore worked is low and insufficient in quantity to fully supply the mill. This is said to be owing to defective ventilation in the various stopes. They are now engaged in sinking an air shaft about 1,000 ft. west of the incline. At 450 ft. in depth below the surface of the ground at this shaft a large body of high-grade ore has been located. The reduction works consist of a 55-stamp wet crushing mill, arranged for raw amalgamation, with the necessary pans, settlers, concentrators, etc. The motive power is a 250-H. P. compound Corliss engine built by Frazer & Chalmers, of Chicago. There is also an air compressor plant, and this is the only mining company in this vicinity operating machine drills. In addition there are foundry, machine and blacksmith shops, as well as a sawmill. A Weston electric light dynamo furnishes light for the various departments. Incandescent lights of 16-candle power are used, in series of four 75-volt lamps on each circuit. This company also owns a mineral concession from the Mexican government 5 by 12 kilometers in extent, within which are situated many valuable prospects.

MINERAL DE OCAMPO, Mexico.

H. A. HORSFALL.

#### THE ACCIDENT AT THE GAYLORD COAL MINE.

Special Report for the Engineering and Mining Journal.

On Saturday, February 10th, slight evidences of squeezing were observed in the workings of the red ash vein, to the west of No. 1 plane at the Gaylord mine, near Plymouth, Pa. After carefully examining the area affected, it was decided by the officials in charge to strengthen the plane by timbering. Accordingly Superintendent Picton organized a party composed of Joseph Olds, Thomas Jones, John D. Morris, Thomas Merriman, Thomas Cole, Thomas Leyshon, Richard Davis, James Ringdino, David W. Morgan, John Hamer, Peter McLaughlin and Michael Walsh, placing his son, Thomas Picton, one of the inside foremen of the colliery, in charge. They began work at a point 600 ft. from the foot and 1,200 ft. from the top of the plane. Superintendent Picton remained with them until 10 o'clock, when he left to go to his home, first cautioning them to be careful, as such work is always attended with danger. At 12 o'clock the men went to the engine-house on the surface to eat their lunch. At that time nothing had occurred to alarm them. At 2 o'clock, George Brace, the stable-boss, visited and conversed with the party. When he left them there was no sign of impending danger, and they were getting along rapidly with their work.

At almost 3 o'clock a jar was felt at the fan, and a shaking was felt in the houses on the hillside. Word was immediately sent to Superintendent Picton, and accompanied by several miners he descended the shaft. On reaching the foot of the plane evidences of the fall were found and at a distance of 200 ft. up it was blocked with coal. A hasty examination showed that a large fall had occurred. Quickly returning to the surface, a party was sent to the outlet on the mountain, and another party to the Rock Slope. The party descended from the outlet for a distance of 3,000 ft. when their further progress was stopped by the fall. The party going down the Rock Slope found the tunnel closed a few hundred feet from its foot. Parties of men were at once organized and sent to search every opening in the mine outside the area of the fall, in the hope that some of the men had escaped and were in darkness in some abandoned chamber or gangway.

Meanwhile, men prominent in mining circles were rapidly arriving

and consulting in the company's office. In the party were President Daniel Edwards and Superintendents Gullym Edwards, Morgan Rosser and Geo. Picton, of the Kingston Coal Company; State Mine Inspector G. M. Williams, Superintendents John and James B. Davis, of the Plymouth Coal Company; Superintendent Thomas Evans, of the Parrish Coal Company, and General Superintendent Elmer H. Lawall, Inside Superintendent Morgan R. Morgans, and Mining Engineer W. J. Richards, of the Lehigh & Wilkes-Barre Coal Company.

All of these gentlemen are in charge of adjoining collieries, and thoroughly understood the difficulties before them.

After a visit to the mines and a thorough inspection of the workings surrounding the fall, it was seen that the officers of the Kingston Coal Company had with remarkable promptitude devised and put into execution the only feasible plan of reaching the men. Already a force of men were at work opening and timbering the plane.

The plane is 1,800 ft. long. The foot is 200 ft. from the shaft, which is about 500 ft. deep. The men were working 800 ft. from the foot of the shaft. Consequently, if the men were caught when they were working, there was 400 ft. of crushed ground between them and the rescuing party. If the men should have received some warning and started toward the shaft, their bodies are liable to be found at any time. Should they have been caught where they were working it will take some weeks; but should they have run up the plane or into the old workings, it may be a matter of months before their bodies are found.

Considerable progress has been made in advancing up the plane, and already 200 ft. have been opened and secured. The squeezing has settled, making it much safer work for the rescuing party. The area affected is nearly 25 acres.

This vein is about 22 ft. thick, and the map shows that it has been regularly and carefully mined. Pillars of a good size have been left. The main top is a hard sandstone, but directly above the coal bed is from 3 to 4 ft. of rotten fire-clay.

The center of the squeeze was at a point west of the plane, and it is believed that there is where the heaviest fall occurred. The men working on the plane probably did not have more than a few seconds warning of the extraordinary danger, as at the last moment the crush must have passed over the pillars like a rocket. Had the men a minute's warning they could have reached the foot of the shaft, where they would have been in comparative safety.

The colliery belongs to the Kingston Coal Company, of which Daniel Edwards is President, and the land to the Gaylord Coal Company. Mr. Edwards and State Mine Inspector G. M. Williams have been constantly on the scene since the accident, and everything that human science and skill can do is being done by them and those assisting in the rescue.

#### THE MINING ENGINEERS' MEETING.

The winter meeting of the American Institute of Mining Engineers began on Tuesday, February 20th, at Virginia Beach, on the Atlantic coast, about 40 minutes' ride from Norfolk, Va. The programme arranged for the meeting, which was pretty closely adhered to, was as follows: Tuesday evening, opening session; Wednesday, excursion to Newport News, Hampton, Old Point and Lambert's Point; Wednesday evening, session; Thursday morning, session; afternoon, session; evening, subscription banquet. Friday morning, closing session; afternoon, excursion to Portsmouth Navy Yard; Saturday, excursion to Dismal Swamp.

The new papers presented at this meeting include a description of the famous Cerro de Pasco silver mines in Peru, by O. F. Pfordte; the Stetefeldt furnace, by C. A. Stetefeldt; Ore-Washing at Longdale, Va., by G. R. Johnson; a description of recent examinations made of the Franklinite deposits of Sussex County, N. J., by F. L. Nason; Mine Explosions from Grahamite dust, by W. Glenn; notes on magnetic phenomena in gold-bearing slates, by C. A. Metzger; the determination of phosphorus in coal and coke, by J. Lychenheim; the unwatering of the flooded Ocean mine, by B. S. Randolph; some statistics on the re-working of anthracite culm banks, by A. W. Sheaffer; an account of the survey of an underground connection, by E. A. Sperry; the refining of gold sulphides, by W. Langguth; notes on the iron ores of East Texas, by W. Kennedy; and an account of some experiments on the refractoriness of fire clays made by Prof. H. O. Hofman and C. D. Demond.

The papers of this meeting largely took the form of written discussions on those presented at the International Congress in Chicago last summer. The papers so discussed included Professor Posepny's on Ore Deposits; Professor Akermann's on Swedish Bessemer Steel Practice; Mr. Campbell's, on the Open-hearth Steel Process; Mr. Case's, on the Bertha Zinc Mines; Mr. Emmons', on the Geological Distribution of the Useful Metals; Mr. Potter's, on American Blast Furnace Practice; Mr. Kennedy's, on Blowing Engines; Mr. Douglas', on Improvements in Metallurgy; Mr. Rickard's, on the Bendigo Gold Mines and on the Stamp Mill, and several other papers; and lastly, the group of papers treating of the Physics of Steel, by Messrs. Osmond, Pourcel and others. This last discussion itself includes several papers of importance in continuation of the subject, accompanied by records of experiments made on variations in the structure of iron and steel.

Rapid Shaft-Sinking.—A recent discussion in relation to rapid shaft-sinking on the Comstock lode led to the collection of the following statistics by the Virginia City "Enterprise": The Savage, Norcross and Chollar joint shaft, known as the Combination, has four full-sized compartments, each 6 ft. in length by 4 ft. in width, requiring an excavation nearly 40 ft. long by 7 ft. wide, to allow room for timbering. This shaft was sunk to a depth of more than 2,500 ft., and closely timbered with 12 by 14-in. timbers, in two years, and several working stations were opened during the same time—each capacious enough for a dance hall. The joint Best & Belcher and Gould & Curry shaft, known as the Osbliston, was sunk to a depth of 2,000 ft. below the surface in 18 months. This shaft has three compartments.



## THE MAYFLOWER MINE, CALIFORNIA.

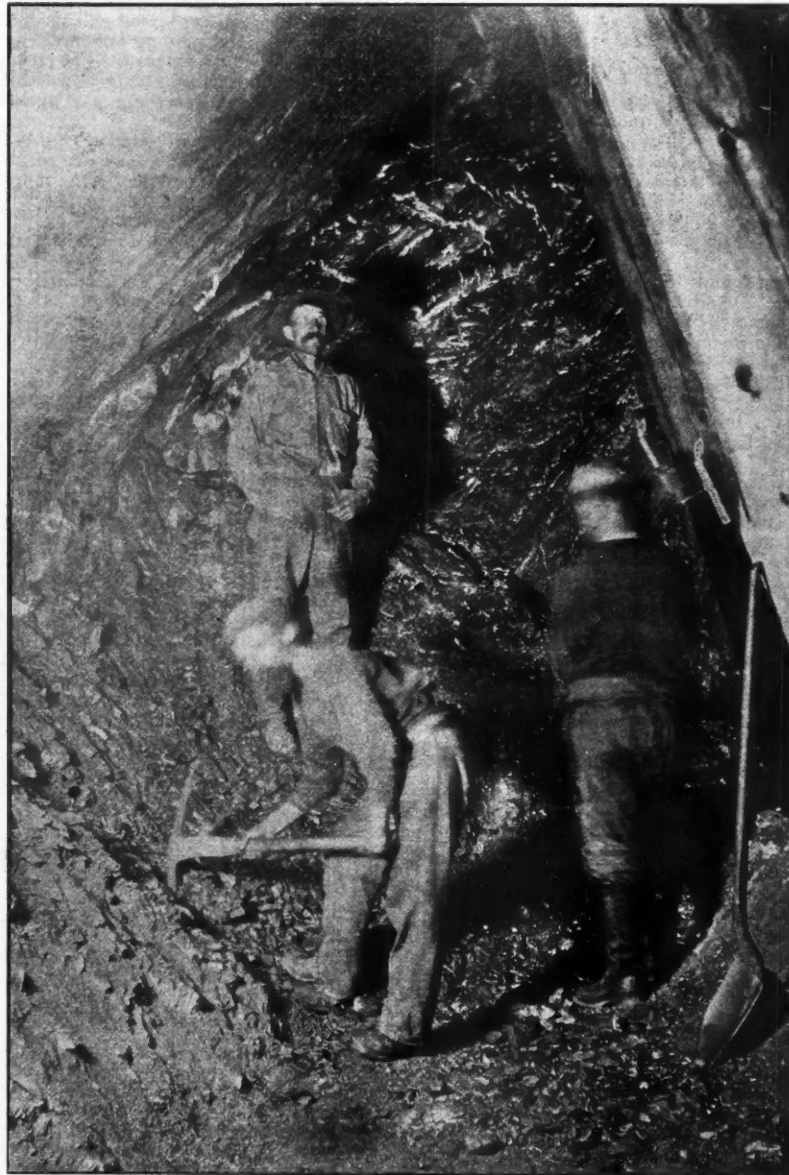
A report on the Mayflower and South Mayflower gold mines in Amador County, California, recently made by Mr. S. H. Emmens, contains some very remarkable photographs of the interior of the workings, made by Mr. Newton W. Emmens, two of which we reproduce herewith, through the courtesy of the author of the pamphlet. We add also some extracts from the report explaining the views and also some characteristics of the district in which the Mayflower mine is located.

Traversing the lower portion of the foothills in a line parallel to the main chain of the Sierra Nevada is an east-dipping belt of slates and eruptive rocks, which continues without intermission for more than 100 miles across the counties of Eldorado, Amador, Calaveras, Tuolumne and Mariposa. Chief among the members of this belt is a graphitic slate seamed with veins of quartz and bordered by walls of greenstone. This quartz-seamed and greenstone-bounded band of

stringers and feeders which, if followed, frequently lead to large masses of ore at their lines of junction with the other veins.

4. Greenstone veins. These are quartz-filled fissures in the greenstone walls. In bygone years they were almost completely ignored or disbelieved in; but modern developments have shown that they are of a great value.

The engravings will enable some idea to be formed of the ore bodies in the Mother Lode. The first is a view taken at the end or breast of the level now being driven south on the hanging-wall vein of the Mayflower mine at a depth of about 300 ft. from surface. In the upper left-hand corner the smooth and regular hanging-wall itself may be observed, and under this is seen the huge mass of slate and quartz forming the vein, while on the right hand are timbers that serve to keep the level open. The second shows the breast of a greenstone vein recently discovered in the 800-ft. level of the Gover mine. The walls are not seen, as the vein is some 50 ft. in width. It consists of an almost solid body of rich gold-bearing quartz,



HANGING-WALL VEIN IN THE MAYFLOWER MINE, CALIFORNIA.

slates is the great "Mother Lode" of California, and is deservedly famous as the richest gold-bearing formation of equal magnitude that has ever been discovered in the whole history of mining. Owing to the softness of the slate, as compared with the quartz and greenstone, the outcrop of the Mother Lode is conspicuously marked from place to place by huge white or green rocks rising boldly from the surface of the ground. The quartz bodies of the Mother Lode occupy fissures in the slate and greenstone. These fissures are irregular, and sometimes cross the slate in both dip and strike; but for the most part they are conformable. The veins thus formed are distinguishable into the following four classes, viz.:

1. The hanging-wall veins. These are mainly contact deposits between the slate and eastern greenstone, and are almost always regarded as the principal veins in Amador County.

2. The foot-wall veins. These are discontinuous bodies of limited extension, both longitudinally and vertically, and are found at various distances west of the hanging-wall.

3. Caunter veins. These are bodies that cut across the slates in dip and strike, and are usually of minor importance except as

and is found continuous down to the 1,000-ft. level, which at present is the deepest working. This bonanza, when first met with, consisted of a mere seam in the greenstone, and in the early years of mining on the Mother Lode would have passed without notice. But Mr. A. B. Call, the superintendent, and Mr. Robert McF. Doble, one of the directors of the Gover mine, determined to drive north on the seam, and were rewarded by finding it widen out into one of the finest ore bodies ever discovered. The large caunter vein at the 300 level in the Mayflower has no well defined walls, and is virtually an interlaced network of veinlets and patches of gold quartz disseminated through the main body of graphitic slate for a width of about 14 ft. In this vein the laminated character of the slate breast is sharply distinguished from the massive appearance of a solid body of quartz.

Experience in all parts of the world has shown that the metalliferous veins of each mining district have local characteristics; and a knowledge of these distinctive features is required for the efficient development of the mines. The history of mining on the Mother Lode in Amador County is an excellent case in point. For many years the gold deposits were believed to be more or less superficial

and pockety, and immediately a vein became poor in depth or longitudinal extension it was abandoned. At a later date the wisdom of driving levels along poor veins until they opened out and became rich again was recognized; but the idea still prevailed that it was hopeless to pursue them in depth. Finally, a few adventurous spirits were enterprising enough to take up some of the abandoned shallow mines and sink the shafts a few hundred feet deeper. They then discovered that the barren zone was of no great magnitude, and that a second series of rich ore bodies existed below. It is now recognized by every mining or geological expert who has examined the mines of Amador County that there are two zones of gold ore in the Mother Lode—one extending from the surface to a depth of, usually, 600 or 700 ft.; and the other commencing at about the 1,100-ft. level, and extending to a depth at present unlimited. The Eureka mine, for example, at Sutter Creek, about 2 miles south of Amador City, has rich ore in the bottom level at 2,200 ft. from surface. This rule of the two zones is so general that as yet no exception is known.

VARIATIONS IN THE MILLING OF GOLD ORES. NO. IX. BENDIGO, AUSTRALIA.

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

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This district has had the misfortune of undergoing more than one christening which explains the fact that it is not so well known in the northern hemisphere as its neighbor Ballarat. It was called Bendigo when in the autumn of 1851 it was changed from a sleepy sheep run to an excited mining camp, but the first name subsequently gave way to the more English Sandhurst, by which it was known for several decades, until in 1891, by a general consensus of opinion, the original name was resumed.

Though the riches of the first-found alluvium were exhausted at a comparatively early period, the later discovery of gold bearing quartz lodes of great value, of unusual permanency and of very peculiar structure has made the Bendigo district the greatest "quartz-reefing" center of Australia. This goldfield now contains 26 mines having shafts exceeding 2,000 ft. in vertical depth. Six shafts are more than 2,500 ft., and one (Lansell's 180 mine) has recently passed the 3,000-ft. mark.

Since the date of its discovery in November, 1851, this district has yielded 12,000,000 oz. of the precious metal, valued at £48,000,000 sterling, or \$240,000,000.

In 1892 the Bendigo district produced 198,009 oz. 4 dwts. 2 grs., of which amount 5,750 oz. 2 dwts. 0 grs. were of alluvial origin, and 192,259 ozs. 2 dwts. 2 grs. came from the quartz reefs. During that year the dividends paid amounted to £268,263, being at the rate of \$6.50 per ounce of gold produced or over 30%.\*

The average yield of gold per ton of quartz ore was 9 dwts. 23 grs., and the average contents of the pyrites or concentrates, 2 oz. 5 dwts. 8 grs. The price of the gold bullion varied from £3 17s. 0d. to £3 19s. 0d. per oz. There were at work in 1892, according to the report of the Secretary of Mines for Victoria, in this district, 1,279 stamps, 105 concentrating tables, 8 Chilean mills and 32 arrastras.

The comparative table which follows will give the chief figures indicative of the mode of treatment at a number of the most representative mills in the district.

The crushing capacity of the mill is at the rate of 360 loads per week for the 30 heads, and 240 loads for the 18 heads. The week has only six working days. A load of quartz ore is about equal to a ton of 2,240 lbs. The rate per stamp is therefore two tons per day in the new section and slightly over that figure in the old part of the mill.

The gratings or screens used are variously made of iron and steel plate punched with from 120 to 180 holes per sq. in. A grating having 143 holes per sq. in. and made by Goyere & Co., at the neighboring town of Epsom, is the one most used. The holes are 23-1,000 in. in diameter. In the 30-head section the gratings have an average life of nine days, but in the old 18-head section this is diminished to six days. The stamps in the older portion of the mill are nearer the grating frame; hence the discharge of the pulp is more rapid, giving increased crushing capacity, but a diminution in the life of the gratings which are subjected to a more violent abrasion by the pulp in the mortar box.

The percentage and value of the concentrates are not given because the ore supply comes from a number of mines and has a very variable composition. In 1890 313 loads of pyrites were obtained and 20,582 tons of quartz crushed. A load of concentrates weighs from 25 to 30 cwt., so that the above amount is equivalent to (say) 460 tons. This does not however in any way properly represent the amount of pyrites in the ore since the concentrating apparatus was at that time very incomplete. The actual percentage of pyrites in the quartz varies from 1/2 to 3%.

The ore is fed into the battery by hand. Automatic feeding machines are not used in Bendigo, nor are rockbreakers.

The gold saving is done by the mortar box, by amalgamating tables, by wells and indirectly by blankets. Mercury is added to the ore in the battery at the rate of 3 to 4 oz. per 5 heads per day when crushing 8 to 10 dwt. ore. More is added when treating richer ore.

The amalgamating tables are covered with sheets of plain, not silver plated, copper. In the old section they slope at 1 5-16 in. per ft., while in the new section the gradient is 1 1/2 in. per ft. The tables are 5 ft. wide and 13 ft. long.

There are five wells in all, the lowermost three are shallow, and do not contain mercury. The other two, at the head of the amalgamating tables, are 3 in. deep and 2 1/2 in. wide.

The blanket strikes are 5 ft. in the clear, divided into three strips, and have a length of 15 ft. In the 30-head section they slope at 1 1/4 in. per ft., in the old section 1 5-16 in. The blankets are washed at an average interval of two hours. At the time of my last visit to the mill no further attempt at concentration was attempted, but since then the enterprising owner has introduced nine Gilpin County (Colorado) shaking tables, which are doing excellent work. The mill at night is lit up by electricity.

The Catherine Reef United, at Eaglehawk, is the oldest mill of the five whose figures are given in the comparative table. It contains 64 stamps. The weight varies. Thirty heads arranged in six batteries weigh 900 lbs., so also do 24 heads in four batteries of six stamps each, while the remaining ten, divided into two batteries, weigh only 750 lbs. each. The heavier stamps crush 2 1/2 tons each per 24 hours, but the light section only 2 tons.

The speed is regulated at from 68 to 70 drops per minute. The height of the drop is 9 in., and is kept fairly constant. The depth of discharge or distance from the bottom of the grating to the top of the die

COMPARATIVE TABLE.

Name of mill.	Number of stamps.	Weight of each.	Number of drops per min.	Height of drop.	Depth of discharge.	Capacity of stamp.	Capacity of mill in 24 hours.	Description of grating.	Holes per sq. in. in grating.	Percentage of concentrates.	Average contents per ton of concentrates.		Fineness of bullion.	Return percentage.	Wear of gratings.	Consumption of mercury.	Water used per stamp per min.
											Oz. <sup>3</sup>	Dwts.					
New Chum Consolidated.....	30	895	72	9	3 1/4	2'0	60	Round punched	170	1 1/2	2	11	955	46	17	7'75	*
Lady Barkly <sup>1</sup> .....	40	965	68	9 1/2	3 1/2	2'1	84	Russia	115	1 1/2	1	15	941	54	12	9'5	7 1/2
Pearl.....	30	840	74	7 1/2	3 1/4	2'2	66	Round punched	168	1 1/2	2	8	954	65	10	6'7	6 1/2
Fortuna.....	48	900	70	8 1/2	4	2'1	100	Round punched	143	.....	Various.	.....	958	55	7 1/2	8'8	*
Catherine <sup>4</sup> .....	64	750 900	69	9	3 1/2	2'1	131	Round punched	143	1 1/2	3	4	952	66	9	7'3	4 1/2

<sup>1</sup> Full name, "South St. Mungo and Lady Barkly." <sup>2</sup> Long tons, 2,240 lbs. each. <sup>3</sup> Silver contents negligible. <sup>4</sup> Full name, "Catherine Reef United." <sup>5</sup> Working days of 24 hours each. \* No figures obtainable.

The Fortuna "crushing works" are the property of Mr. George Lansell, the leading mineowner of the district. This mill is engaged in treating the ore coming from properties belonging to the proprietor, such as the "180," "222" and Comet mines, of others in which he holds a large interest, such as the Lazarus, and in doing a general custom business.

The plant consists of two portions, containing 48 stamp heads in all. Six mortars of five heads each are comparatively new, dating to 1888, while the remaining 18, in three mortars of six heads each, are old. The stamps weigh 900 lbs. each, this total weight being distributed as follows: Disk or tappet, 66 lbs.; shank or stem, 325; tophead or boss, 159; head or shoe, 198; false bottom or die, 152 lbs. The stem is 12 1/2 ft. long, 8 ft. of 3 1/4 in., and 4 1/2 ft. of 2 3/4 in. iron.

The speed averages 70 drops per minute, and varies from 68 to 75. The height of the drop varies from 8 to 9 in. At the time of the introduction of new dies the issue or depth of discharge is 2 in., but this increases as the dies wear away to a maximum of 6 in.

The shoes are 10 in. high by 9 1/4 in. in diameter. The dies are 5 in. high. Steel shoes and dies were tried and were found to wear well, but being imported from England at a cost of £30 per ton, it was found more economical to use locally made cast iron shoes and wrought iron dies at a cost of £12 per ton for either. The wear per ton of ore is 16'4 oz. of the shoe and 6'2 oz. of the die. The tappets are screwed on; no keys are used. The order of the drop is not well adjusted, and approximates 5 and 1, 2 and 4, 3.

\* For 1893 the results were even better.

is measured by 2 in. when new dies have been placed in position, and increases to a maximum of 5 in. as they wear down. The dies or false bottoms are 4 in. deep and 10 1/2 in. in diameter.

The grating in ordinary use has 143 holes per sq. in. The 180 and 200 sizes are occasionally used. Their average life is nine working days.

The gold saving is done in the mortar boxes, to which mercury is added, by the wells and the copper plates, supplemented by blanket strikes. There is no concentration proper beyond the saving of the heaviest pyrites by blankets.

The tailings, owing to the lack of natural fall, are pumped into settling pits.

Eight bottles of mercury, each containing 75 lbs. avoirdupois, are consumed in a year, or at the rate of 7'3 dwts. per ton of ore crushed. The mill only works during the daytime—16 hours out of the 24. In six months 19,550 tons were treated.

The ore comes from a spur formation in the Catherine Reef United mine. The gold occurs in the quartz in a coarse and generally free condition. The average mill return is as follows: In a fortnight of 12 working days 786 tons were crushed and yielded 146 oz. 7 dwts. of bullion, together with 4 tons of blanketings carrying 12 oz. 18 dwts. The gold has a caratage of 22, 3, 2, equivalent to about 952 fine; 250 gals. of water are used per stamp per hour.

The Lady Barkly mill is the joint property of the Lady Barkly and the South Saint Mungo mining companies. Each company operates half the mill which consists of two sections of 20 stamps. Each stamp weighs 9 cwt. The stem weighs 336, the tappet 60, the boss 236, the



shoe 196, and the die 109 lbs. The mill crushes at the rate of 84 tons per day. Twenty heads in 12 days (a fortnight), working 16 hours per day, put through 335 tons.

The gold saving is done by the mortar box, by copper plated amalgamating tables, by wells and indirectly by concentrators. Mercury is added to the battery at the rate of a teaspoonful per 8 hours when crushing the average (5 dwt.) ore. The mortars of the two sections of the mill are of different pattern, those of the St. Mungo being the most roomy. As a consequence the latter have a slightly less crushing capacity but save a larger proportion of gold inside the battery. There is a considerable variation in the percentage of gold saved inside the mortar, but on an average it is about equal to that saved outside.

The wells are four in number. One of them is cast in the lip of the mortar box and owing to the vibration to which it is subjected all the mercury which it contains is shaken out and it therefore serves no useful purpose. Just above the plates there is another deep well. In addition there are two shallow ones, also holding mercury. No blanket strakes are in use.

The concentration of the pyrites in the ore is done by machines of local manufacture and known as Halley's percussion tables. They are regulated at a speed of 171 to 175 strokes per minute. The value saved in the concentrates represent 8% of the total yield from the ore. The amalgam retorts over one-half, about 54%. The millstuff treated is very low grade, but owing to the width of the ore bodies the Lady Barkly Company has paid good dividends on 5 dwt. material.

The Pearl mill belongs to the mining company of the same name. It

into three longitudinal partitions, the total width being 5½ ft., having a length of 11½ ft. They have a slope of 1½ in. per ft. The residue from the washing of the blankets undergoes separation on straight sluices or "ties," whence the sand obtained goes to the concentrators, and the pyrites is added to the concentrates from the shaking tables.

These last are of the ordinary variety (Halley) and are six in number. They are worked at a speed giving them 165 to 180 strokes per minute.

The order of the drop of the stamps is 5, 3, 4, 2, 1, but 5 and 1, 4 and 2 fall almost simultaneously. It will have been noticed that in spite of a very shallow discharge the largest portion of the yield is saved by the mortar itself. This, as is suggested by the high percentage of bullion obtained in retorting, is owing to the coarse character of the gold in the ore. From the grating to the nearest point of the shoe the distance is 3 in., between the dies ¾ in., from the back of the mortar to the nearest point of the die 2 in., and from the die to the front of the mortar 1 in.

The feeding of the battery is done by manual labor. In order to keep them supplied the 30 stamps require the services of two laborers per 8 hour shift—one of whom, a young fellow, gets 33s. (\$7.92) per week, while the other, an older man, is paid 40s. (\$9.60).

The country rock in which the quartz lodes occur forms a large proportion of the millstuff. It has a very variable hardness, from soft slate to quartzitic sandstone. An effort is made to mix the material and to assist the regular working of the mill.

The new Chum Consolidated mill is the best in Beidigo. It was



GREENSTONE VEIN IN THE GOVER MINE, CALIFORNIA.

was erected comparatively recently, viz., 1888. The plant consists of six batteries containing five heads each. Each stamp weighs 7½ cwt. The number of drops per minute varies from 72 to 76. The height of the drop is kept at from 7 to 7½ in. The issue or depth of discharge has the variation noticed at most of the mills. When starting with new dies the depth is 2 in., attaining a maximum of 4½ just before they are removed. The dies are 3½ in. thick (occasionally 4 in.), they weigh 80 lbs. each, and are made of wrought iron. The shoes are made of cast iron, they have a depth of 9 in. and weigh 192 lbs. each. The wear per ton of ore is at the rate of 19 oz. for the shoes and 4.7 oz. for the die.

The crushing capacity of the mill is at the rate of 400 tons per week of six working days. The mine is not, however, often able to supply the full amount of ore required.

The gratings are of the usual round punched iron plate. The kind generally in use contains 168 holes per sq. in. When working full time the gratings have an average life of 10 days.

The gold saving is effected by the mortar box, by amalgamating tables outside, by wells, by blanket strakes and finally and indirectly by concentrating machines. Mercury is added to the ore when in the battery. Of the total gold obtained from the treatment 8% is the yield from the blanketings and concentrates, 7% comes from the wells, 20% is extracted on the amalgamating tables and 65% is obtained from inside the mortar box.

A clean-up is made of the battery once per week, and of the copper plates outside once per fortnight. The amalgamating tables are covered with plain copper, they are 5 ft. wide and 11 ft. long, and they have a gradient of 1½ in. per ft. The blanket strakes are subdivided

erected in 1889 and is in excellent working order. The motive power is obtained from a triple expansion engine supplied with steam by two multitubular return flue boilers.\*

The plant consists of 30 stamps, arranged in two sections of three mortars. Each stamp falls with a weight of 8 cwt. The boss or tophead weighs 193 lbs., the shoe 175 to 185 lbs. The speed varies from 70 to 75 drops per minute. The height of the drop is rarely changed from 9 in. The depth of discharge is 2 in. at the time of placing new dies in position, and increases to a maximum of 5 in. as they wear down. The dies are 4 in. thick. The crushing capacity of the mill is at the rate of 725 tons per fortnight of 12 working days. The gratings or screens are made of round punched Russia iron, containing 170 holes per sq. in. The holes are 0.023 in. in diameter. The gratings last about 17 full working days. They would give better wear but for the vertical lines of weakness produced by the press employed in their manufacture.

The gold saving is done by the mortar box itself, by wells or mercury traps outside, by amalgamated tables and indirectly by concentrators and blanket strakes. The mortar becomes an amalgamator by the addition, at regular intervals, of free mercury to the ore, as it is fed into the battery. A teaspoonful—about 2½ oz.—is added to each five stamps every shift of eight hours. The distance from the screen to the shoe is 3½ in. As a rule in this district it is from 4 to 5 in. In the most recently erected plants there has been a tendency to make the mortar more roomy in order to increase the proportion of gold saved inside.

The amalgamating tables are lined with plain copper plate. Their

\*This may appear hardly worth mention, but the fact is that boilers of modern design are rare in the colonial mining centers. The single tube Cornish boiler forms the prevailing type.

length is 10 ft., their width  $5\frac{1}{2}$  ft., and their slope  $1\frac{1}{4}$  in. per ft. The length is subdivided by a "well" or deep mercury trap, and three "ripples" or shallow catch-pits. The first piece of plate is 23 in. long, and its surface is broken at a distance of 8 in. from the mortar by the deep well above mentioned. It is 7 in. deep and is always kept full of mercury. It holds the contents of one flask, or 75 lbs. avoirdupois. The ripples are distributed over the remainder of the length of the tables.

From the "ripple tables"—as the Bendigo millman often calls the amalgamated plates—the pulp passes not first over blankets and then to concentrators, but vice versa. The concentrators are Halley percussion tables worked at a speed of 180 to 200 strokes per minute. There are six of them or one to each mortar. Then come the blanket strakes which have a total length of 14 ft. 9 in. and a width of 5 ft. 6 in. The width is subdivided into three partitions. The slope is equal to a fall of  $1\frac{1}{2}$  in. per lin. ft. The blanket residues are usually very poor, and consequently the blankets are only washed at intervals of eight hours. A test lot is occasionally sent to the chlorination works so as to determine what kind of work the concentrators are doing. A recent lot resulting from a fortnight's crushing amounted to only 4 tons, yielding 5 oz. of gold altogether. When found to be poor, as in this instance, it is the usual custom to return the blanket sand for retreatment by the concentrating machines.

The following four consecutive fortnightly mill runs will give an idea of the kind of work the mill does:

Ore.	Yield by Amalgamation.		Yield by Concentration.	
	Ozs.	Dwts.	Loads of concentrates.	Yield in gold.
737 tons.	102	15	10	22
710 "	130	5	9	28
750 "	107	2	9	19
703 "	149	6	9	25

Thus 2,900 tons were crushed for a production of 459 ozs. 8 dwts. in retorted gold obtained in the mill itself, and 95 ozs. 15 dwts. in melted gold extracted at the chlorination works. The ore, therefore, gave a total yield of 3 dwts. 4 grs. per ton. Each "load" of concentrates is equal to about  $27\frac{1}{2}$  cwt., therefore the yield per ton was 1 oz. 16 dwts. The concentrates amounted to 18% of the weight of the original ore. The gold from the pyrites is 970 to 975 fine, while that obtained at the mill is from 950 to 960 fine. In retorting, the amalgam yields 46% of its weight in gold. Of the total amount of amalgam obtained, 55 to 60% comes from inside the mortar box, and the remainder from the plates and wells outside. Of the amount saved outside the battery more than half is obtained from the deep mercury well. Of the total saving of gold affected by the mill, 81% comes by amalgamation and 19% by concentration.

The loss of mercury is at the rate of one bottle (75 lbs.) per 6 to 7 weeks. This is equal to a consumption of  $7\frac{1}{4}$  dwts. per ton of ore crushed. About 150 ozs. of mercury are in use for each battery, with its series of wells and plates.

The following additional particulars will be of interest. The feeding of the ore is done by hand, and done badly. This will be referred to again. The shoes weigh 175 to 185 lbs.; they last 9 to 10 weeks, crushing 115 tons of ore; when worn out they weigh 38 lbs. The wear is therefore at the rate of 19.7 ozs. of iron per ton of ore. The dies are 4 ins. deep and 10 ins. in diameter. They are square in section, with corners beveled. When new they weigh from 96 to 100 lbs.; when discarded, 26 to 35 lbs.; they last 28 weeks, crushing 335 tons. The wear is therefore at the rate of 3.4 ozs. per ton of ore. The shoes are made of cast iron and the dies of wrought iron, provided by the local foundries at a uniform rate of £12 per ton.

After a half-year's operations the copper plates are overhauled and cleaned with acid. At a Christmas clean-up this process yielded 646 ozs. amalgam, giving 235 ozs. 4 dwts. of gold from the treatment of the 18 copper plates. This cleaning spoils the gold-saving qualities of the plates, because it robs them of their surface of gold amalgam. It is done in order to squeeze out an extra dividend.

There is not sufficient fall to carry away the tailings. They are pumped into a first or "slum" dam, where they are allowed to settle, then the clear water is pumped into a second dam, whence it is returned to the mill.

The New Chum Consolidated Mining Company is one of the very best managed mining concerns in Australasia, as the following figures testify.\* For the half year ending June 30th, 1890, there were 9,586 tons sent up from the 1,800-ft. level, yielding 1,722 ozs. 19 dwts. of gold, at the mill, and 278 ozs. 8 dwts. (from 106 loads), at the pyrites works. The total value of the yield was £7,943 5s. 9d. The average of the ore was 3 dwts. 14 grs. only, but this gave a profit of £1,510 6s. 9d., equivalent to a shilling dividend on each of the 28,000 shares of capital stock. The yield was 16s. 9d. (say, \$4) per ton, and the cost 13s. 5d. (say, \$3.22) per ton.

The tailings of the mill have been carefully sampled and assayed. They are said to carry only 1 dwt. 4 grs. per ton. The right to treat them is sold to Chinamen for £8 5s. per month, one of the conditions being that the Chinamen shall maintain the dams in good condition.

The five mills which we have passed in review are fairly representative of the best practice of the district. The Catherine Reef United is one of the oldest crushing plants, the New Chum Consolidated is one of the most recently erected, while the other three belong to intermediate periods.

(To be Continued.)

The New Orleans Bridge.—A dispatch from New Orleans says that the contract for building the Southern Pacific Railroad bridge over the Mississippi River at that city has been awarded to the Phoenixville Bridge Company at the cost of \$5,000,000.

\* See "The Bendigo Goldfield," by the writer in the "Transactions" (Vol. XX.) of the American Institute of Mining Engineers.

#### ABSTRACTS OF OFFICIAL REPORTS.

##### CONSOLIDATION COAL COMPANY, MARYLAND.

This company, which owns a large estate in the Cumberland region and also owns the Cumberland & Pennsylvania Railroad, reports that for the year ending December 31st, 1893, it mined 907,559 tons of coal, a decrease of 31,136 tons from 1892. The company's railroad carried 2,326,371 tons of coal, an increase of 109,724 tons over 1892.

The financial report shows: Gross earnings from mines, railroads, rents, etc., including value of stock of coal on hand, \$2,377,728; total expenses (exclusive of interest), including 265 tons of heavy steel rails and extraordinary outlays, \$2,009,020; net receipts, \$368,507; interest paid on funded debt for 1893, \$116,900; leaving a balance to credit of profit and loss of \$251,607; add balance December 31st, 1892, of \$76,720, making a total balance to profit and loss December 31st, 1893, of \$328,327. Out of this balance was paid for dividends \$205,000, and \$45,247 was carried to the royalty fund, leaving a balance of \$78,081. The royalty fund now amounts to \$577,793, invested in interest bearing securities; it is intended to compensate for the coal removed from the company's lands.

##### DOMINION COAL COMPANY, NOVA SCOTIA.

The report for the year 1893, presented at the annual meeting, in Boston, states that the company was organized February 16th, 1893, and has mined 834,019 tons of coal, exclusive of the Victoria mine output. Coal shipments increased over the preceding year 90,000 tons. The sum of \$200,000 has been expended on the railroad to Louisville, which is expected to be completed this year, and \$150,000 has been spent on plant and mining machinery, and about \$100,000 for tugs and barges. The fiscal year of the company is to be changed so as to begin March 1st, with the annual meeting in June. The treasurer's report shows that 834,019 tons of coal were sold for \$1,189,499, with a gross profit of \$231,163. With the profit on transportation the net earnings were \$334,431. Expenditures for machinery and 10% on equipments were written off, leaving a net profit of \$246,709, from which interest, sinking fund and preferred stock dividends were paid and a balance of \$51,977 carried forward. If the full year's charges had been deducted the net profit and loss would have been \$21,977. The balance sheet shows assets as follows: Property, \$17,729,407; coal in stock at distributing points, \$81,504; cash, supplies and accounts receivable, \$343,152; total, \$18,154,063. The liabilities are given as follows: Common stock, \$15,000,000; preferred stock, \$1,500,000; first mortgage bonds, \$1,500,000; total capitalization, \$18,000,000; interest and accounts payable, \$87,355; sinking fund, \$14,731; balance of profit, \$51,977; total, \$18,154,063.

##### LEHIGH COAL AND NAVIGATION COMPANY.

The report of this company for the year ending December 31st, 1893, shows receipts as follows: From railroads, \$1,814,887; canals, \$10,987; Lehigh coal lands, \$489,847; miscellaneous, \$79,945; total, \$2,401,666. The charges against income were: General and legal expenses, \$58,530; rentals, \$180,360; taxes, \$158,141; interest, \$833,600; depreciation on improvements, \$110,268; sinking fund, 10c. per ton on 1,084,503 tons of coal, \$108,450; total, \$1,449,349, leaving a profit of \$952,317 for the year. From this there were paid two dividends, each of \$1.50 per share (making 6% for the year), amounting to \$860,799; leaving a balance of \$91,518 to be added to profit and loss for the year.

The coal tonnage of the Lehigh & Susquehanna Railroad, and the Lehigh Canal was, in 1893: Wyoming, 3,130,646; Upper Lehigh, 505,507; Black Creek, 6,018; Beaver Meadow, 764,348; Mauch Chunk, 1,540,614; Lehigh Valley, 31,240; Delaware, Lackawanna & Western, 2,879; Schuylkill, 26,385; total, 6,007,637 tons. The distribution of this tonnage was as follows, compared with 1892:

	1892.	1893.	Changes.
East of Mauch Chunk by rail	4,707,801	5,232,344	Inc. 515,443
East of Mauch Chunk by canal	377,509	271,733	Dec. 65,776
On line above Mauch Chunk	211,083	222,901	Inc. 11,011
To connecting lines above Mauch Chunk	313,774	291,461	Dec. 22,213
Total	5,569,622	6,077,637	Inc. 438,015

The gross earnings of the company's railroads for the year were \$5,229,804, of which the company received as rental,  $33\frac{1}{3}\%$ , or \$1,743,268. The earnings showed an increase of \$207,582 over 1892.

The report says: "The production of coal from the company's property was greater than in any previous year in its history, exceeding by 151,679 tons that of any other year since the first shipment was made, the largest production heretofore being in 1892, when 1,293,662 tons were mined. The total production in 1893 was 1,445,341 tons, the cost of producing which was \$1,355 per ton, being a decrease of 12.1 cents per ton from the cost of 1892, and 5.1 cents from that of 1891. This reduction in cost was due to the larger tonnage and economies in the general mining expenses. The net earnings from coal were \$489,847, being an increase over 1891 of \$331,009, and over 1892 of \$146,770.

"The mines are all in good condition and capable of producing as much, or more, coal in 1894 than in 1893, and should more coal be mined this year than last, we can easily maintain the same ratio of the increased tonnage from our mines as in 1893. As some of our breakers were constructed many years ago, and the facilities for properly preparing a large output inadequate, we shall soon be obliged to build others of a more modern type with improved machinery, and it is proposed that one such breaker shall be constructed this year at such point as shall be determined upon. The preparation of the coal has been improved from year to year, and on the completion of the new screen building, now in course of construction near Hauto, about April 15th, we shall have increased facilities for the preparation of the sizes smaller than pea coal, which are coming more and more in demand for manufacturing purposes each year. . . .

"The business of the canals showed a considerable reduction, owing to late opening and accidents from ice and freshets. The new coal pockets at Coalport were completed and put in use in July last. From that date until the close of navigation, 106,173 tons of coal were



dumped and transferred into boats at a saving of  $1\frac{1}{2}$ ¢. per ton on the cost of doing this work over the old pockets. It is expected that this saving can be considerably increased in 1894. On the Delaware Division Canal we are building a new three-span steel aqueduct at Point Pleasant to replace the wooden one, which was rotten and unsafe, and are also partially rebuilding the aqueduct at New Hope. This work will be completed before the opening of navigation, and no other extraordinary repairs will be required on the canals during this year.

The second track of the Lehigh & Susquehanna Railroad was completed in December last, and is now in operation, making that road double-tracked from Phillipsburg, N. J., to the head of the Wilkes-Barre Planes. We paid the lessees in December \$101,889 for construction work done by them in 1892 under the terms of the lease. The Lehigh & Lackawanna Railroad and the Wind Gap & Delaware Railroad are now being operated by the Central Railroad Company of New Jersey, under contract for a term of five years, at a fair percentage of the gross receipts and a fixed minimum rental. Our lessees have maintained the roads owned by your company to the highest standard, and they are in excellent condition. The rents have been paid promptly and regularly, and the terms of the lease have been fully and satisfactorily complied with."

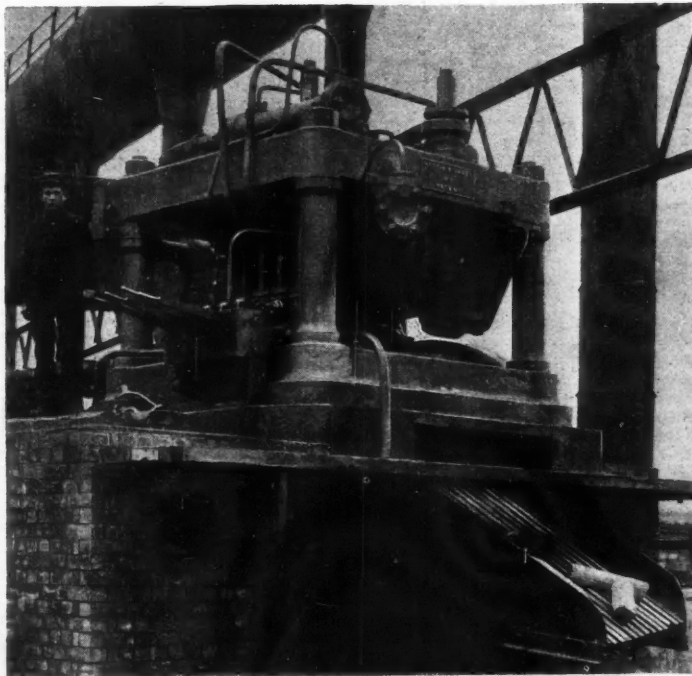
#### THE MARTIN & JAMES HYDRAULIC PIG IRON BREAKER.

We illustrate herewith a pig iron breaker which was designed by Messrs. Edward P. Martin and Enoch James, with a view to facilitating the removal of the pig iron from the casting beds at the Dowlais works, Cardiff, South Wales. The output from each of the furnaces at these

presents a fresh, cold fracture, may be broken direct into trucks, thus reducing the cost of handling.

#### THE COAL MINES OF MISSOURI.

The report of State Mine Inspector Charles Evans, of Missouri, for the year ending June 30th, 1893, shows that there were made 215 inspections, with reference to the ventilation of mines and the safety of the miner. The two essentials of safety in mining and the foremost object sought by inspection were good ventilation and the safety of the miner, secured by the possession of facilities for exit in case of danger. Two inspections were made of all the larger mines, and some of them were visited three times. Wherever a deficiency was found or the requirements of the law neglected, the superintendent or the operator was notified of the deficiency and instructed to have the same attended to as soon as possible. The larger mines generally were found in a healthy condition, with the requirements of the law closely observed and obeyed, and suggestions for improvements were, as a rule, readily accepted. As a result of the Inspector's work in the field and instructions to mine-owners, he reports the sinking of 13 escapement shafts (though some of them are not yet completed), the erection of five ventilating fans and four new furnaces and the enlarging of three old ones; three hoisting ropes condemned and same replaced by new ones; safety-catches have been attached to all cages; air-ways have been widened out and cleaned and new overcasts have been built. The importance of adopting the double-entry system, and of splitting the air into separate currents in the mines has been urged. These features of practical mining offer a better system of ventilation, which can be



THE MARTIN & JAMES HYDRAULIC PIG IRON BREAKER.

works amounts to upward of 1,400 tons per week, and as the whole of this is allowed to become cold on the beds, some difficulty was experienced in emptying the molds and preparing them for another cast. In order to obviate this, or at any rate to minimize the inconvenience as far as possible, an apparatus was devised for dealing with the removal and breaking up of the pig iron by mechanical means. This apparatus consists of quick-running, overhead steam traveling cranes, which sweep the whole surface of the pig iron beds. The pigs are cast in groups of 30; it is important that they should be molded at equal distances apart, and means are devised for insuring this, so that the three fixed hammers on the hydraulic rams may exactly suit the distances of the three pigs. When cast, the iron is not touched until it has become cool. The overhead crane then picks up the whole group of 30 pigs and runs with it at a high speed to the breaker, depositing it on a light four-wheeled carriage running on an incline toward the breaker. On arrival the group is drawn forward by a pawl of sufficient length of stroke to place the groups under the hydraulic ram, which, at one stroke, breaks the pigs, although only one at a time, the sow being broken by a second ram. The four pieces of broken pig slide down a strong shoot into a railway wagon, the detached sand falling between the bars forming the shoot. It is stated that in this way one machine is capable of dealing with 4,000 tons of pig iron weekly, working only from eight to ten hours daily, while the whole cost of carrying away the iron, breaking the pig, etc., is covered by a charge of  $1\frac{1}{4}$ ¢. per ton. By the adoption of the pig breaker it is possible to dispense with the pig fillers. It is also possible, the beds being cleared with such rapidity, for the furnace men to do all the molding required for the night by daylight; they can also keep the molds clean, and thus secure an immunity from boils. The metal being allowed to become cool before being touched, the sows are not liable to bleed, and in this way a great saving in scrap is effected. When required, the iron, which always

extended from time to time with the best results until the mines be abandoned.

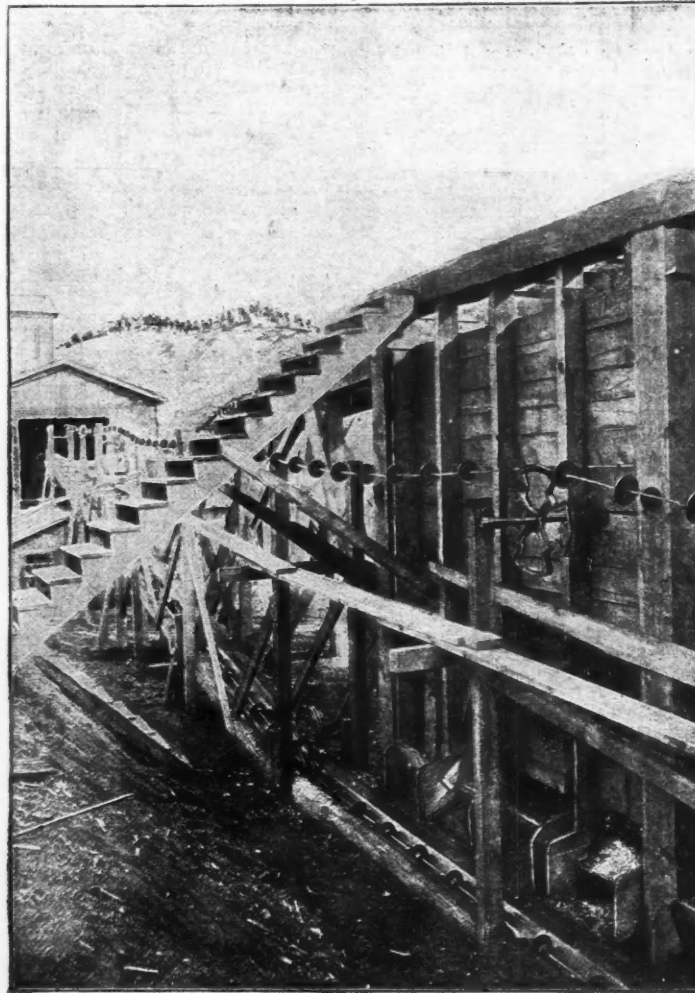
While the increase in tonnage for the year ending June 30th, 1893, does not meet the expectations of which the first six months of the year gave promise, yet, when the general business depression of the country is considered, the outcome proves encouraging and very satisfactory. The coal product for the year equaled 3,190,442 tons, against 3,017,285 tons for the year previous. The actual amount received for the product at the mines aggregated \$3,999,681. This increased production was made with 51 mines less than operated the year preceding, showing not only a larger business for the mines operating, but the capacity and facilities for increased production as well. During the past year 404 mines, large and small, have been operated, and are classed as follows: Shafts, 154; slopes, 85; drifts, 92, and strip-pits, 73. The power employed at 80 mines was steam, and at 119 horses were used. Artificial ventilation is produced by the use of 54 fans and 100 furnaces. The method of mining at 117 mines is under the long-wall system, and 211 mines use the pillar-and-room plan. The powder consumed in the mines the past year amounted to 64,553 kegs, costing \$132,132.

The average number of men employed in the mines during the winter months was 7,285 miners and 1,947 other employes; during the summer months 4,859 miners and 1,442 other help were employed, giving a total of 9,232 men employed in and about the mines in winter and 6,301 in summer, or an average the year round of 7,766 employes. The total number of accidents for the year was 47, of which 21 were fatal and 26 non-fatal. The average number of tons of coal mined for each life lost was 151,926, and for each non-fatal accident 122,709 tons. During the year 17 new mines were opened and seven abandoned. Of the new mines 15 are on an extensive scale, and supplied with improved plants.

## THE JEFFREY CABLE CONVEYOR.

Chain conveying machinery, designed and made by the Jeffrey Manufacturing Company, Columbus, O., has been the subject for illustration on several occasions in our columns. The accompanying illustration represents one of that company's wire cable conveyors in use at the works of the Ellerslie Gas & Coke Company, Winnifred Junction, W. Va., and resembles somewhat in general appearance the chain drags for conveying material. It consists principally of a special steel cable, with circular conveying flights attached at regular intervals of 24 ins., operating on special sheave wheels. The conveying clamps run in a V-shaped trough, lined with iron curved to suit the flights, and the material, which in this case is fine coal, is fed into the trough through which it is taken to the retorts.

This style of machinery is specially adapted for long distance conveying, and is one of the simplest forms of conveyors made. At the Ellerslie works the distance is some 250 ft., and while but a  $\frac{3}{8}$ -in. cable is used, it can be increased to twice that length without impairing its strength or usefulness. This conveying machinery is especially desirable for handling coal, and material of that class, and while it is recommended by the manufacturers more particularly for long distance, it can also be used for shorter distances, although the saving



THE JEFFREY CABLE CONVEYOR.

in the cost, as compared with chain conveyors on short runs is not so great as in the longer runs. The Jeffrey company recommend this style of conveyor very highly for conveying nut, slack and pea coal, and any one needing such machinery will be interested in the special circular on this subject, which can be had on application, and which describes very fully its construction and management.

**Petroleum in Somerset, England.**—For several years past, says the London "Mining Journal," the tenants of Ashwick Court, Shepton Mallet, the residence of Dr. Newton Wade, have complained of the fouling of the well whence the supply of water for domestic and other purposes is obtained. During the drought last year the cause was discovered to be petroleum oil, of which a considerable quantity was obtained from the well. Afterward expert advice was sought, and Prof. Boverton Redwood and Mr. Topley, Government Geologist, proceeded to the spot, surveyed the neighborhood, and examined a number of witnesses. The water in the well was then found to be only slightly affected, but the oil globules were pronounced by Professor Redwood to be characteristic of crude petroleum, and this, together with the isolated position of the house and the quantity of oil spoken to by witnesses, satisfied the experts that no accidental leakage had occurred into the well. This opinion was soon corroborated, for as water was pumped out the quantity of oil increased.

## RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of Pennsylvania.

## Restrictions in Right of Way.

A deed of all the merchantable coal in an opened mine under the grantor's land, with right of way on said land to carry the coal away, does not convey the right to take out of the pit on said land and carry by such right of way coal mined under another tract, nor to dump at the pit's mouth the refuse from the latter; nor can the grantee, having accepted such deed, assert a servitude on the land for such purposes by reason of the practice of the former common owner of both tracts.—Vogel vs. Webber, 28 At. Rep., 226.

## What Constitutes Co-tenancy in Oil Well Lease.

Each of two firms bought an undivided one-half of certain leases of land on which an oil well had been drilled, and prepared the well for pumping, each paying one-half of the expense. When the first well was put in order, they drilled another well, and divided the expense incurred. The oil was run into pipe lines serving the district, and one-half of it was credited to each firm. Such transaction does not show a partnership, but is a co-tenancy. A sale by the sheriff, at

the instance of a creditor, of the title of one of the firms in the leases, passed title, and the sheriff's vendee became a tenant in common with the other part owner.—Butler Savings Bank vs. Osborne, 28 At. Rep., 163.

## Right to Termination of Oil Lease.

A lease for oil and gas mining contained a covenant that the lessee should commence operations within three months, or thereafter pay lessor \$160 a year till work was commenced. The fact that operations in the neighborhood demonstrated that a well on the property would be of no avail did not release the lessee from his obligations. The provisions of the lease that failure of the lessee to make a payment when due should render the lease null and void, and not binding on either party, does not make the lease void, except at the option of the lessor. In an action on such lease by the lessor, the lessee alleged that a contemporaneous parol agreement that he should have the right to terminate the lease at any time when satisfied that there was no oil or gas in the leased land, and, as well for the protection of the lessee as of the lessor, there was inserted in the lease that failure of the lessee to make payment when due, should render the lease null and void, and not binding on either party, and that but for such agreement, and the belief of the lessee that it was substantially expressed in the lease, he would not have signed it. This was the mere assertion that the lessee thought the language used gave him



the right to terminate, and was therefore no ground for relief.—Cochran vs. Pew, 28 At. Rep., 219.

**Construction of Proposition and Acceptance of Contracts.**

Where a contractor proposed to a lessee to erect a rig and drill a well a certain depth of his leases, with the further provision that if it was decided to drill any more wells on his leases or "in the vicinity" up to the number of five, he was to have the contract therefor at the same price. At the end of the proposition was written: "Accepted. Contract to be drawn in accordance with the above proposition"; and then was added: "This is about right, and will be satisfactory to us." Pending a reference of this by the parties to an attorney to draw a contract, the contractor drilled the one well, and was paid therefor. The proposition and acceptance were not a completed contract, so that, a contract not having been drawn, he could recover damages for the refusal to allow him to drill other wells which the lessee thereafter sunk. Even if the proposition and acceptance were a completed contract, which the lessee sunk at the distance of two miles from the leased premises, would not be "in the vicinity" thereof within the contract.—Sparks vs. Pittsburg Company, 28 At. Rep., 152.

**New French Furnaces.**—Five new blast furnaces are in course of erection, or projected, in the Longwy district of France, adjoining Luxemburg, including one at the works of De Saintignon et Cie., one at those of Raty et Cie., Works, Saulnes; two at those of Ferry, Curique et Cie., at Villerupt-Micheville, and one at Gouraincourt, the foundations of which are already laid. At the same time there is question of increasing the capital of the Societe des Hauts-Fourneaux de la Chiers by a million francs, which about represents the cost of a new furnace, but this project is said not to be imminent. All these furnaces will be of considerable height, with five or six hot-air stoves.

**Salt Manufacture in Michigan.**—The report of State Salt Inspector George W. Hill, of Michigan, for the fiscal year ending November 30th, 1893, gives the following statement of production: Salt inspected during the year, 3,514,485 bbls.; salt now in bins, 506,402 bbls.; total, 4,020,887 bbls. Deducting 1,001,780 bbls., the amount in bins November 30th, 1892, we have 3,019,107 bbls. as the total manufactured during the year, a decrease of 690,515 bbls., or 18.6%, from the preceding year.

There are now 109 firms and companies engaged in the salt manufacture in the State; they own 112 blocks and 4,000 solar salt covers, the total manufacturing capacity being 5,425,000 bbls. yearly.

**The Pan-American Railway Project.**—Mr. Wm. F. Shunk, the engineer in charge of the surveys for the Pan-American Railway, which is projected to extend from Mexico southward through the Central American Isthmus, Ecuador, Peru, Bolivia and Chili, has completed his report. About nine months were spent on the surveys, the engineers working north and south from Panama. Mr. Shunk states that the project is feasible. The line in South America will run mainly between the east and west ranges of the Cordillera of the Andes, at an elevation of 6,000 to 10,000 feet above sea level. About \$22,000,000, he says, will be the cost of road-bed and bridges alone, exclusive of ties, rails and track equipment, and the road can be built in ten years. There will be a large amount of tunneling required. The report has been filed with the Inter-continental Railway Commission.

**Consumption of Steel Rails in France.**—The consumption of steel rails by the French railroad companies for 11 years past is reported by the "Bulletin du Comité des Forges" as follows, in metric tons:

1883	311,334	1887	108,896	1891	112,857
1884	284,071	1888	93,868	1892	163,840
1885	249,416	1889	58,046	1893	129,388
1886	170,595	1890	66,844	Av. 11 yrs.	161,733

The consumption, it will be noted, has been exceedingly variable. Last year showed a decrease of 21% from 1892, but an increase of 13% over 1891; the consumption was less than half that of 1884, for instance, but much more than twice that of 1889. It was 20% below the average for the 11 years.

**French Imports and Exports in 1893.**—The French imports of minerals in 1893 were valued as follows, in francs: Coal, 182,324,000 fr., a decrease of 1.2%; mineral oils, 37,682,000 fr., an increase of 22.7%; copper, 36,381,000 fr., an increase of 7.1%; nitrate of soda, 30,172,000 fr., a decrease of 33.1%; other minerals, 66,600,000 fr., an increase of 4.5%. The exports included machinery valued at 32,292,000 fr., a decrease of 10%; tools and other articles of metal, 69,485,000 fr., a decrease of 14.4%; minerals of all kinds, not manufactured, 24,373,000 fr., an increase of 7.5%, as compared with the previous year.

**French Iron and Steel Exports and Imports.**—The imports and exports of iron and steel in France for the years 1892 and 1893 are reported as follows, in metric tons:

	Imports		Exports	
	1892	1893	1892	1893
Iron ores	1,683,723	1,630,442	304,616	309,673
Pig iron	84,370	82,351	120,748	104,625
Ferro-manganese, etc.	2,476	3,798	7	64
Manufactured iron	18,424	21,587	30,302	30,467
Steel	5,407	5,736	9,000	10,783

In addition to the above there are reported "temporary imports" of pig iron, finished iron and steel, amounting to 74,283 tons in 1893. For the same year the re-exports were 70,052 tons. Coke imports for 1893 were 1,443,421 tons, an increase of 19,802 tons over 1892. Coke exports were 50,806 tons, or 773 tons more than in 1892.

**American Copper Wire for Ocean Cables.**—Some time since the Bennett-Mackay Cable Company placed a contract for a new ocean cable with the Siemens works. A large share of the wire and the copper which is to go into it will be of American manufacture. The contract

for the wire, about 1,500 tons, was distributed among three makers, one in England, Felten & Guillaume, Köln, Germany, and the John A. Roebling's Sons Company, Trenton, N. J. The copper rods for drawing the wire for the English part of the contract are made by the John A. Roebling's Sons Company, which thus makes one-third of the heavy copper conductor wire of the cable and the rods for another third of the copper wire required. The John A. Roebling's Sons Company have practically completed their shipment of wire, none of which was passed at less than 99% of Dr. Matthiessen's standard. The average of all tests was 99.4%. Only 104 pieces of wire were thrown out, and with one exception they were above 98%, while the aggregate of all the wire actually shipped was 99.873%.

**Mining Accidents in Great Britain in 1893.**—According to the preliminary return just issued, says the "Iron, Steel and Coal Times," there were 806 fatal accidents in and about the coal mines of the United Kingdom, causing 1,056 deaths. Compared with 1892, the accidents were fewer by 41, the deaths more by 40. These accidents are separable into several groups. There were 14 firedamp explosions, as against 12 in 1892, and they caused 158 deaths, as against 123. Of these deaths, 142 were suffered in Yorkshire by two explosions, one of which was the terrible Thornhill disaster. Four hundred falls of roof caused 411 deaths, whereas in 1892 there had been 21 more falls and 24 more deaths. Then 103 of the sum total of deaths were caused in the shafts of mines—more by 22 than in the previous year; and 265 were caused by miscellaneous accidents underground, chiefly on inclined planes and tramways; while there were 119 deaths on the surface, about mine heads.

The table which shows at what hour of the shift the underground accidents have happened is very instructive. The fatality of the various hours is given in their order as follows: 81, 71, 85, 70, 71, 92, 70, 54, 45, 35, 8. These figures are of accidents, not deaths, and the abnormal figure for the sixth hour needs therefore to be explained; but they seem to dispose of the contention that long hours are conducive to accident.

**Testing Coins by the Assay Commission.**—The annual testing of the coins of the various mints in the United States began on Feb. 14th at the Philadelphia Mint by the Assay Commission appointed by the President. The following members were present: Henry D. Welsh, Pennsylvania; Horatio C. Burchard, Illinois; Prof. J. A. Quarles, Virginia; Prof. Frederick Prime, Pennsylvania; Andrew Mason, New York; Cabell Whitehead, District of Columbia; Girault Farrar, Louisiana; James W. Ellsworth, Illinois; Prof. George F. Winston, North Carolina; Prof. Arthur L. Perry, Massachusetts; L. Clarke Davis, Pennsylvania; Talford P. Linn, Ohio; John W. Woodside, Pennsylvania. Ex-officio members: Hon. James H. Eckels, Comptroller of the Currency; Prof. H. G. Torrey, Assayer of the United States Assay Office at New York; R. R. Preston, Director, and William E. Morgan, Secretary of the Bureau of Mints.

The acting chairman, Professor Perry, named the following committees: Counting—Messrs. Quarles, Farrar, Ellsworth, Davis, Linn, Woodside, Eckels. Assay—Messrs. Prime, Winston, Perry, Mason, Whitehead, Torrey, Linn, Davis. Weighing—Messrs. Burchard, Perry, Winston, Quarles, Mason, Welsh, Woodside, Ellsworth, Farrar. The Commission then adjourned to give the committees time to do their work.

The Committee on Counting began its labors immediately after the adjournment of the Commission. The Pyx box, containing the coins from the Philadelphia, San Francisco, Carson City and New Orleans mints, was brought in on a truck and opened. The box contains 12 apartments—three for each mint—and, as the coins are delivered, one is placed in the Pyx box for each 1,000 gold coins and one for each 2,000 silver coins. The Pyx box is kept in a vault, and is doubly locked, the keys being held by the superintendent and assayer. It is not opened until the annual visit of the Commission, when it is unlocked in their presence. The number of gold pieces in the box exceeded that of any former years, except two, since the Mint was established. During the year 1893, \$50,000,000 in gold was coined. During the year 1861, \$78,000,000 was coined, and in 1873, \$53,000,000.

**PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.**

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office:

TUESDAY, FEBRUARY 13TH, 1894.

- 514,447. Rolling Mill Guide. Patrick L. Day, Cleveland, O.
- 514,478. Ore Separator. Ernest F. Lacour, Genoa, Italy.
- 514,497. Steam Boiler Furnace. Bernhard Rüber, Dresden, Germany.
- 514,590. Air Pump. John Dickens, New Brunswick, N. J., Assignor to the Dickens Mfr. Co. same place.
- 514,608. Hydraulic Air Pump. Edward H. Weatherhead, Cleveland, O., Assignor to the Cleveland Faucet Company, same place.
- 514,616. Water Elevator. George W. Campbell, El Paso, Tex., Assignor of one-half to F. J. McMurray, same place.
- 514,625. Centrifugal Blower. Jacob O. Poole, Newark, N. J., Assignor to the New Jersey Blower Company, same place.
- 514,642. Grinding Mill. Julius T. Capers, Charleston, S. C.
- 514,659. Suction and Force Apparatus for Pumping Fluids. Waltham M. Morgan, Kansas City, Mo.
- 514,662. Hydraulic Car Dumping Device. Norton H. Pine, Eureka, Cal.
- 514,681. Electrolytic Cell. Ernest A. Le Sueur, Ottawa, Can.
- 514,691. Steam Hammer. Jean Beche, Jr., Hückeswagen, Germany.
- 514,698. Muffle Furnace. Abram A. Breneman, Brooklyn, N. Y.
- 514,709. Brick Kiln. Thomas Green, Sioux City, Ia.
- 514,766. Process of Making Wire. Benjamin Mountain, Castleford, England.
- 514,787. Power Hammer. James B. Sweeney and Robert W. Laird, St. Johnsbury, Vt.
- 514,788. Dredging Bucket. Thomas Symonds, Leominster, Mass.
- 514,800. Car Dump. Hiram P. Williams, Somerdale, O.
- 514,838. Nitro Compound and Process of Making Same. Robert C. Schuppahaud, Brooklyn, N. Y.
- 514,839. Regulator for Air Compressors. Henry C. Sergeant, Westfield, N. J., Assignor to the Ingersoll-Sergeant Drill Company, New York, N. Y.
- 514,841. Steam Boiler. George H. Taylor, London, Assignor to Wilhelm Otto Axel Lowe, Liverpool, England.
- 514,843. Air Lock for Caissons. William C. Barr, Jersey City, N. J.
- 514,860. Smokeless Boiler. William S. Plummer, St. Louis, Mo.
- 514,890. Apparatus for Pumping and Compressing Air. Charles W. Buerkle and Bernard A. Buerkle, Jr., Pittsburg, Pa.

## PERSONALS.

Mr. W. B. Middleton and the firm of Shields & Middleton, mining and consulting engineers, have established their offices at No. 725 Cooper Building, Denver, Colo.

Mr. Robert Stevenson, mining engineer, of San Francisco, has been appointed agent of a syndicate recently formed in Glasgow, Scotland, to work gold mines in California.

Mr. Thomas Weir has resigned his position as general superintendent of the Monte Cristo Mining Company, at Monte Cristo, Washington, and has removed to Salt Lake City, Utah.

Mr. John B. Farish, mining and consulting engineer, has removed his offices to Rooms 521-524 Cooper Building, Denver, Colo., where he is prepared to examine and report on mining properties.

Mr. E. D. Cleland has resigned his position as general manager of the Australian Broken Hill Consolidated Company. His successor is Mr. George Smith, who has been assistant manager for some time past. Mr. Cleland, it is said, will remove to West Australia.

Mr. John I. Blair, who was this week re-elected as manager of the Delaware, Lackawanna & Western Company, has been a member of the board continuously since 1850. Mr. Blair is now 92 years old. Mr. Samuel Sloan, who was re-elected president of the company, has held that office for 27 years.

Mr. Charles A. Bennett, formerly manager of the Morris County Machine Works, at Dover, N. J., has accepted the position of Eastern agent of the Webster, Camp & Lane Machine Company, of Akron, O., and has his office in New York, where his energy and ability as a mechanical engineer will find full scope for exercise.

## OBITUARY.

Henry E. Leveaux, president of the Independence Mining Company, Boulder, Mont., committed suicide on February 14th. He was born in England and was 35 years of age.

Raphael Palmer Smith died on January 25th at Monte Christi, Santo Domingo. He was born in Kentucky and went to California at the age of 18 to complete his education as a civil and mining engineer. Soon thereafter he became connected with the management of the North Bloomfield Gravel Mining Company, of California. Later he went to Santo Domingo as chief engineer of a hydraulic enterprise.

Willard G. McGregory died at Pasadena, Cal., on January 28th, aged 66 years. He was a well known pioneer both of California and Montana, and his career was a successful one. He was born in Orleans, N. Y., and went to California when quite young. He was a member of the Argonaut Club of Forty-niners. In 1864 he went to Alder Gulch, Mont., and in 1865 he was associated with O. A. Sedman, Emil Olsen and I. C. Smith and L. W. Frary in the organization of the Montana Flaming and Mining Company. In 1867 Sedman and McGregory began laying flume on the Sedman & McGregory claim, which was a success from the beginning.

## SOCIETIES AND TECHNICAL SCHOOLS.

New York Railroad Club.—At the regular meeting in New York February 15th, Mr. R. A. Parke read a paper on the "Vertical Influence of Counterbalancing," which was generally discussed by members present.

Colorado Scientific Society.—The regular monthly meeting was held on the evening of February 5th. Mr. H. van F. Furman read a paper on "The Melting and Refining of Gold Bullion." The author described the practice of the branch mill at Denver and offered several valuable suggestions for the retorting of amalgam and the preliminary refining of base bullion. The brief discussion which followed dealt chiefly with the different methods of taking accurate samples of bars of bullion. Mr. T. A. Rickard then gave a brief description of the lode structure and geological occurrence of the silver-lead mines of Pontgibaud, France. The genesis of the ore deposits was touched upon and attention was drawn to the fact of the non-persistence in depth of the ore bodies of this particular region.

Scranton Engineers' Club.—The regular monthly meeting was held February 10th. After the regular order of business had been gone through, a discussion was introduced by A. H. Storrs on the "Use of Mine Gas for Firing Boilers." The Delaware, Lackawanna & Western Company is making a trial of this at one of their collieries near Scranton. The gas, which by analysis shows 90% of carbonated hydrogen, is piped directly from the mine to the boiler-room at the surface. At the next meeting, March 10th, E. A. Barth will present a paper on the "Underpinning of Heavy Buildings Over Old Mines," being a plan which he is about to carry out under the new High School Building in this city. Arrangements are being made for a lecture to be delivered to the Club in the near future on the Shaw gas testing machine.

Pennsylvania State College.—The "Mining Bulletin," a publication issued bi-monthly by the department of mining engineering of the college, has made its initial appearance. The board of editors consists of Dr. G. W. Atherton, president of the college; M. C. Ihlseng, professor of mining engineering; H. H. Stock, assistant professor; and T. C. Hopkins, instructor in geology. The "Bulletin" is one of the means by which the college hopes to keep in sympathetic relations with the industrial interests of the Commonwealth. For several years the college has issued quarterly bulletins giving the results of the work of the agricultural experiment station, and the object of this bulletin is to do similar service for the mining interests. It is desired to establish a museum of natural products of the State, by means of which all such persons as are directly connected with the industry may obtain at once information as to the sources of supply, properties, uses and adaptability of the various material. Not only will such matter be of invaluable aid to students and graduates, but also to architects and engineers. A nucleus is already installed.

University of Chicago.—The sum of \$18,000 was recently appropriated toward furthering the geological department at the University. Of this nearly \$4,000 will be spent in books; another \$4,000 will probably go into the purchase of apparatus; the remainder will be spent in the purchase of rare mineral specimens. Among the most important addition to the instruction and research division will be a set of relief maps of the world, and which will be probably the best of its kind ever made. The maps are to be made in America and Europe. They will be of sizes up to 6 ft. square and will be curved to show geographically the rotundity of the earth, every geographical feature being represented in relief. Prof. Charles Van Hise is at present making a study of the Lake Superior mining region. Professor Chamberlain has been mostly occupied with the Walker and Columbian museums for some time past. Joseph P. Iddings, associate professor of petrology, is finishing his work on the volcanic rocks of the Yellowstone. Mr. R. A. F. Penrose, associate professor of economic geology, is giving courses in mining engineering, in which he has had much practical experience. In April Prof. Rollin D. Salisbury will leave for New Jersey, where he is connected with the State Geological Survey. During the winter months geological studies will be concentrated at the University. In other seasons parts of the faculty will be engaged in outside work, in State, government or mining surveys.

Civil Engineers' Society of St. Paul.—The regular meeting was held February 5th, after a dinner at the Commercial Club, in which 18 members participated. The president called upon Mr. C. A. Hunt, who explained in a general way the repairs now in progress on the dam at St. Anthony Falls. Mr. Hilgard then gave his theory of the failure of a portion of the roof of the St. Paul & Northern Pacific tunnel at Westminster street. The tunnel has a clear width of 23 ft. and in that part under consideration was quite flatly arched with four concentric rings of brick at the crown instead of five as provided by its designer after brick had been ordered substituted in this section in place of cut stone used in other sections of the tunnel. In the course of seven years the arch at under side of crown had settled about 1 ft. and a cross-section of the intrados showed a slightly sinuous line. Careful inspection failed to prove any definitely measurable displacement or settlement of the vertical sidewalls. In settling, the brick rings separated from 1 to 3 in. as near as might be on the line of greatest pressure and but slightly elsewhere. In Mr. Hilgard's opinion the settling of the arch was due to the gradual grinding out of mortar from both ring and radial joints effected by the vibration of roof and the general jarring caused by the frequent passing of trains through the tunnel. Furthermore, this section of the arch although resting on heavier sidewalls than those supporting the arch, lacked the lateral support of the contemplated filling which had been indefinitely postponed. Mr. Muensser followed with a few remarks on the measurement of water in connection with the test of a pumping engine of 6,000,000 gallons capacity, and distributed blueprint copies of an original diagram for weir measurements, giving quantities in cubic feet per second from gauge readings for all weirs up to 10 ft. in length. President Wilson then produced some topographical maps of the Connecticut State survey.

## INDUSTRIAL NOTES.

The Keystone Rolling Mill, at Pittsburg, started up on February 20th, with non-union men.

The Standard Iron Works, San Diego, Cal., have established a branch at Phoenix, Ariz.

The Rogers Locomotive Works, at Paterson, N. J., which had been closed 10 weeks, resumed work on February 19th.

The Rogers Locomotive Works, Paterson, N. J., resumed work February 19th, having several orders for locomotives to be filled.

The Austin Engineering Company, Pittsburg, has received orders for Green engines of 40, 80 and 175 H. P., and for several boilers, including two of 200 H. P. each.

The large works of the Thomson-Houston Electric Company, at Lynn, Mass., which have been only partially employed for three months past, started up on full time in all departments on February 19th.

A meeting of delegates from the lodges of the Amalgamated Association of the Pittsburg district was held in Pittsburg, Pa., on February 19th, when it was resolved to stand by the association scale.

The James P. Witherow Company, Pittsburg, held its annual meeting last week, when the board of directors was re-elected as follows: L. Rainey, president; Geo. Best, treasurer; H. M. Attwood, J. P. Witherow and R. S. Smith, directors.

The Duquesne Forge Company, at Rankin, near Pittsburg, has resumed operations in part, after an idleness of several months, giving employment to about 125 men. A large order for heavy steel forgings from the Carnegie Steel Company has been received.

The Cataract Construction Company, of Niagara Falls, has placed another order with the Westinghouse Electric and Manufacturing Company for a 5,000-H. P. generator. This is the second order of the kind the company has placed with the Pittsburg Concern.

The Lakeside Nail Mill, at Hammond, Ind., commenced operations on February 19th, with a full force of rollers. The East Chicago Iron and Steel Works, of the same place, also began operations on Monday, after an idleness of six months. Both plants will be run seven days a week.

The roof for the new electric light station for the Citizens' Electric Light, Heat and Power Company, at Lancaster, Pa., is to be furnished by the Berlin Iron Bridge Company, of East Berlin, Conn. The same company is building an iron roof for the dye-house of George C. Hetzel & Co., at Chester, Pa.

The Oliver Iron and Steel Company held its annual meeting in Pittsburg last week and elected the following officers: H. W. Oliver, president; John Phillips, vice-president; James B. Oliver, treasurer; E. G. Applegate, secretary, and H. W. Oliver, D. B. Oliver, John Phillips and D. A. Moore, directors.

Advices from Pottstown, Pa., say that the rolling mill of the Potts Brothers at that place resumed on February 20th, after a prolonged idleness. The Universal Mill, of the Pottstown Iron Company, fired up on the same date, after several weeks' idleness. The 112-in. plate mill of the same company also began operations.

The Andrews Brothers Company, Youngstown, O., held their deferred annual meeting on the 14th inst. The following officers were elected for the ensuing year: L. E. Cochran, president and general manager; Mrs. E. H. Andrews, vice-president; H. W. Heedy, secretary and treasurer. The Chicago office will remain under the management of Mr. John McLaughlan, who established the office 11 years ago.

The Carborundum Company, of Monongahela City, Pa., will increase its capital stock to \$200,000. The increase will be used for the purchase of the property now occupied by the company and at present owned by the Monongahela Electric Light Company and for the extension of the business. Recently an order was received from Messrs. Claudius Ash & Sons, of London, Eng., for \$10,000 worth of carborundum goods.

A new blooming mill for the Homestead Steel Works of the Carnegie Steel Company, Limited, has been contracted for with Mackintosh, Hemphill & Co., Pittsburg, who will make the manipulator and tables for the same. The firm has the contract for a new 38-in. blooming mill for the Duquesne Steel Works of the Carnegie company, which will be one of the heaviest in the country. A pair of 40 x 60-in. reversing engines for driving this mill is included in the order. Engines will be of massive construction, weighing about 550,000 lbs.

Two London firms, Easton & Anderson and W. T. Gooden & Co., have been amalgamated under the name of Easton, Anderson & Gooden. Easton & Anderson are large manufacturers of hydraulic and other machinery and are regular contractors to the government, while W. T. Gooden & Co. are an electrical firm who were the pioneers in England in the application of electricity to mining purposes. Mr. Llewellyn Atkinson, partner in the old firm of W. T. Gooden & Co. and director of the amalgamated firm, is the best known "electrical mining" engineer in Great Britain.

A press dispatch from Pittsburg, Pa., says that James Todd and Frank Slocum filed a bill in equity on February 19th, against C. Y. Wheeler and the Sterling Steel Company. In May, 1889, the plaintiffs invented a new method of making aluminum steel and made an agreement with the defendants whereby the latter could use the invention upon paying a royalty of 1 cent per pound. This royalty was paid up to April last, when it stopped. The defendants have been using the process in making projectiles for cannon for the government and from this alone there is due \$20,000 to \$25,000. An accounting is asked for with an order compelling the defendants to pay the royalties.

The Clayton Air Compressor Works have removed their offices and salesrooms to the second floor of



the Havemeyer Building, 26 Cortlandt street, New York, retaining their former store as a warehouse. It is of interest to note that the Clayton works made their first appearance in the "Engineering and Mining Journal," Volume I., as advertisers, July 28th, 1866, and that their card has not once been absent from our columns during the long intervening period of nearly 28 years. As old and well-tried friends, we wish the Clayton works every success in their new and handsome quarters, and trust that their business will continue to prosper and to grow as steadily in the future as it has in the past. That it will do so we have no doubt, since they have earned success by excellence in work and honorable business methods.

The Jeffrey Manufacturing Company, Columbus, O., report many recent sales and continued demand for their chain belting and conveying machinery. They claim to manufacture the largest line of chains made. Catalogues describing their chain specialties, wire cable conveyors and mining machinery can be had upon request. The recent meeting of the Ohio Institute of Mining Engineers, by the way, calls attention to the fact that reference is frequently made to this company's well known mining machines, as the Lechner machines, and in some cases as the Legg machine. This machine formerly went by the names of Lechner and Legg, while the manufacturer's name at that time was the Lechner Manufacturing Company; but it has since been changed to the Jeffrey Manufacturing Company, and the machine should now be called the Jeffrey machine.

The Gates Iron Works, of Chicago, manufacturers of the gyratory rock and ore breaker, well known as the "Gates Crusher," have recently purchased the entire plant, consisting of all buildings, tools, machinery, stock, patterns, drawings, etc., of the Chicago Iron Works, which have an established reputation in the United States, Canada, Mexico and in the South American Republics for the high-grade mining machinery they manufacture. With this valuable addition to their plant, the Gates Iron Works are in a better position than ever before to build any kind of machinery required for the reduction and treatment of ores, which fact, coupled with their half century of experience in this line of manufactures, enables them to furnish to their customers modern machinery of the best types, both as regards material and workmanship, fully guaranteed to do the work required of it, at the lowest prices. Any one, contemplating the purchase of machinery for mining or milling purposes, will find it of interest to communicate with the Gates Iron Works, at 50 South Clinton street, Chicago, or, to any one of their branch offices: 237 Franklin street, Boston; 136 Liberty street, New York; and 73a Queen Victoria street, London, England.

**MACHINERY AND SUPPLIES WANTED**

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

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

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

**GENERAL MINING NEWS.**

**ALABAMA.**

The coal production of the State for 1893, as reported by State Mine Inspector James D. Hillhouse, was 5,170,042 tons, including all coal mined. This is a reduction of 73% from 1892, due chiefly to the falling off in demand from furnaces and factories. The production of coke for the year was 1,063,902 tons.

**Jefferson County.**

Morris Iron Mining Company.—Arrangements are being made to resume work at this company's mines.

Westbrook Coal Mine.—This mine has been sold to J. D. Leak, who will operate it hereafter.

**Walker County.**

American Coal Company.—This company, it is said, has placed \$50,000 in bonds, and will proceed with the development of its mine.

**ALASKA.**

Alaska-Treadwell Gold Mining Company.—The alleged robbery from the chlorination works of some \$8,000 in gold has been followed up by the local officers and Frank Jurgens, who was employed in the works, has been arrested on the charge of taking the property. He has been employed in the works for several years and had always been considered a steady and reliable man. The gold was taken from the vat in the form of precipitate.

Comet Mine.—On this mine, at Berners' Bay, development work is going on steadily, with good prospects.

Greek Boys' Mine.—The upper tunnel on this mine, at Berners' Bay, says the Alaska "News,"

has struck the ledge, about 1,500 ft. above the lower tunnel.

**ARIZONA.**

**Cochise County.**

Copper Queen Consolidated Mining Company.—Operations at this company's property are being energetically carried on, says the Phoenix "Herald." At the present rate of production there is ore in sight for a dozen years' work. Large bodies of sulphuret ores have been opened up, in some places 100 ft. wide, which will necessitate a change in the manner of working and new machinery is in process of erection. The deepest workings of the property are but 400 ft. and in shafts, drifts and winzes amount to several miles. The slopes are large. The Arizona and Southeastern railroad from Fairbank to Bisbee, 26 miles, was built by stockholders of the company. Mr. Ben Williams superintends both companies. Some 400 men are employed and every provision is made for their safety and comfort.

**ARKANSAS.**

**Baxter County.**

It is reported that W. A. Culp has discovered copper ore in the shaft he has been for some time engaged in sinking near Culp.

**CALIFORNIA.**

**Mono County.**

Standard Consolidated Mining Company.—This company will pay dividend No. 88, of 10 cents per share, on March 15th.

**San Bernardino County.**

(From our Special Correspondent.)

Morongo Gold Mining and Milling Company.—This corporation has purchased a 10-stamp mill and are now erecting it at the mine. It will be in active operation, most probably, two weeks hence. On the 200 level the cross-cuts show 27 ft. of ore going from \$8 to \$90 per ton. Three tons of ore extracted and worked as a sample yielded \$90 per ton.

**COLORADO.**

Colorado Fuel and Iron Company.—This company has begun suit against Delos A. Chappell, of Las Animas, to collect \$58,751.06 alleged to have been fraudulently converted to his own use. It is set forth in the complaint that September 26th, 1887, the Colorado Coal and Iron Company made a contract with Chappell whereby that company undertook to expend \$60,000 in developing the coal lands of the Gray Creek Coal and Coke Company in consideration of a lease thereof for 20 years. Chappell, it is claimed, had a controlling interest in the property. The plaintiff charges that the money was entrusted to Chappell to spend in developing the property and that instead of carrying out the agreement he pocketed the entire amount. The Colorado Fuel and Iron Company sues as the successor of the Colorado Coal and Iron Company under the consolidation.

**El Paso County.**

Portland Mining Company.—T. G. Coudon has filed notices with the county clerk that the following lodes heretofore conveyed to other persons have been conveyed to him: The Portland lode, the Vanadium, the Bobtail No. 2 and the Queen of the Hills. This completes the Battle Mountain deal which resulted in the formation of the Portland company with a capital stock of \$3,000,000.

**Gilpin County.**

American Flag Mining Company.—The Central City "Observer" reports good progress at this property. A contract to drive the 500-ft. west level 100 ft. has been let and it is being done as rapidly as three shifts of miners can do it. The fourth level is also being driven, but by two shifts of miners employed by the company. Sufficient milling ore is turned out to supply 20 stamps at the stamp mill. The smelting ore shipped last month amounted in all to 80 tons. The greater portion of this mineral is obtained from the slopes of the fourth level.

**Lake County.**

Cary-D'Avignon.—R. J. Cary, plaintiff in the Cary-D'Avignon case in equity, which has occupied the attention of the district court, at Leadville, for a number of weeks past, received a verdict in his favor on February 15th. The action was the result of a difference of opinion between R. J. Cary, plaintiff, and Dr. F. F. D'Avignon, defendant, as to what constituted Mr. Cary's interest in the Orion, one of a group of valuable city mines, on which D'Avignon had obtained a lease. The case involves \$20,000.

Leadville Smelters.—The finishing touches are now being put on the preparatory work that has been going on at the Union smelter for the last three weeks, and it is expected the plant will blow in this week. Many improvements have been made, and the increased facilities will result in a larger output than the smelter has heretofore been capable of producing. The Arkansas Valley smelter is now employing 325 men and an air of old-time activity is noticeable about the property.

**Ouray County.**

Virginus.—This mine has added 25 men to its force and is getting ready for an increased output. It is expected that this mine will employ 400 miners during the spring and summer season. The ore in the tunnel and lower levels is said to be running well in gold.

The following items of Ouray mining news are taken from our exchanges: Ore shipments from Ouray are increasing, due, partially, to the mild weather and partly to the persistent search for gold. Finds of gold ore in paying quantities are getting common.

In case the Silverton railroad should become blockaded this winter, as it does every winter, the ore from the Red Mountain mines will be shipped out via Ouray, to Ouray by wagons and pack trains and thence to Durango by way of Ridgway. This guarantees these producers of both gold and silver to work all the year round, which means a great deal to the Red Mountain district and to all of Ouray County.

American-Nettie.—The labor trouble on this property has been adjusted and ore is again being taken out.

Bell Tunnel.—The biggest mining project now under way in Ouray County is the Bell tunnel, being driven through the Camp Paquin district. The large veins in the mines in that section are being cut by this tunnel.

Bright Diamond.—The pending sale of this mine, one of the biggest and best gold mines of this district, fell through a few days ago, because the owners raised \$25,000 on the price at the last moment. The Marcus Daly and Senator Jones syndicate had the option.

Champion.—The best strike recorded during the past few days is in the Champion mine, in Poughkeepsie Gulch. The owner has opened up a body of ore 6 in. wide. Assays run high.

Chicago.—A tunnel is being driven into this gold mine and is taking out enough ore to pay for the tunnel as it progresses. The Chicago is one of the prominent gold producers of the west side gold belt. A gold vein is already in sight, which is tapped by tunnel No. 1, higher up the mountain.

Ridgway Smelter.—The agents for the proposed new smelter at Ridgway are busy getting new properties bonded and leased every day, the last one being the Congress mine, at Red Mountain. They also have the Ironclad on the Ouray gold belt.

Slide.—This silver mine is shipping three cars of high-grade ore a week. Only high-grade ore goes out from the camp now. The lower grades are stored away to await future developments in the silver market.

West View.—It is said that this mine an old-time and valuable producer, has been purchased by a syndicate of mining men, who will put a large force of men at work immediately. The figures in this case are \$75,000.

**Pitkin County.**

Cowenhoven Tunnel.—This tunnel, under Smuggler Mountain, has been started up and a number of men are at work. It had been idle since January 19th, 1893.

Durant.—The Durant tunnel, which was run originally to connect with the Conemara shaft, has been extended several hundred feet beyond that point. At about 200 ft. beyond the old shaft a large station was cut and a shaft sunk. The depth at present is 175 ft., comprising two levels. At the second level another large station is cut and drifts have been started, one to cut the Conemara ore body at a lower depth and the other to prospect still further the ground of the Aspen Mammoth, from which such enormous stores of rich ore were taken in early days. A 100-H. P. Westinghouse motor is in operation in the shaft. The cars are loaded in the drifts, run onto the cage, hoisted above the tunnel level and dumped into chutes. These chutes discharge their contents at the touch of a lever into the tunnel cars to be hauled by mules to the surface. The Durant company has all its work done by contract, hiring only the cage men and drivers. The contractors, it is understood, pay better wages than are called for by the scale agreed upon between the Miners' Union and the owners.

**Summit County.**

Summit Gulch Mining and Milling Company.—At the annual meeting of this company the following directors were elected: Thomas N. McCann, of New Jersey, and W. S. Devlin, Theodore Townsend, S. M. Vaughn and D. I. Ezekiel, of Denver. The property is near Breckenridge, and is said to be in 20 in. of ore worth \$23 gold. The 10-stamp mill resumes on March 1st.

**GEORGIA.**

**Cherokee County.**

Rudisill Gold Mine.—This mine has been sold to J. T. Orme and others, of Atlanta, who will organize a new company and develop the property.

**IDAHO.**

**Ada County.**

Boise Gold Mining Company.—This company, says the Boise City "Statesman," has been formed to operate the Golden Star mine, near that city, recently purchased from James Flanagan and others. A Crawford mill and other machinery have been ordered for the mine and it is expected active work will be commenced by March 1st. The capital stock is \$1,000,000, divided into 100,000 shares of the par value of \$10 each. The incorporators are: E. H. Lewis, C. B. Ascew, who is the secretary; Peter Bobkirk, L. E. Rice, D. W. Hum-

phries, W. C. Cowgill and Harry Raymond, all Oregon and Washington men.

#### Boise County.

**Pioneerville Gravel Gold Company, Limited.**—This is the name of a company formed in London to work the partially worked gold deposits in Grimes Creek. The fact that these deposits were being treated for by an English syndicate was recorded in the "Engineering and Mining Journal" in the issue of December 9th, 1893. The company has a capital of £60,000; but so far nothing has been brought before the public.

#### Kootenai County.

**Nellie Mine.**—The owners, A. P. Horton and O. R. Young, are working steadily on this mine and are just now drifting on the vein. They have been taking out some good ore.

**Silver Chord Mining Company.**—Arrangements are being made to prosecute work actively as soon as the snow will permit.

#### Owyhee County.

**Black Jack.**—This mine is running steadily, with about 60 men employed.

**Trade Dollar.**—Work is being done at three different points in the mine at present, says the Silver City "Avalanche." A contract has been let to extend the No. 3 tunnel into the ground recently purchased from Dan Feour, and the contractors are pushing the same. The adit tunnel is also being extended north on the vein. A force is employed with the Burleigh drill, at a point about 1,100 ft. from the mouth of the adit tunnel where they are following the vein, which was lost when the tunnel was driven. Something like 300 ft. will have to be driven to again enter the tunnel, but when completed will shorten the tunnel by about 500 ft. They are now in about 40 ft., and have a small streak of pay. About 20 men are employed at the mine, working three shifts of eight hours each.

#### Shoshone County.

**Bunker Hill & Sullivan Mining Company.**—The work is being carried on steadily, without reduction in the force.

**Helena & Frisco Mining Company.**—This company is working steadily with a good force, and results are said to be satisfactory, in spite of the low prices of silver and lead.

**Murray Placers.**—Preparations are being made to work these placers on a large scale as soon as the weather will permit.

**Standard Mining Company.**—This company is working with about one-half a full force. It is reported that an increase will be made soon.

**Tiger Mine.**—Some development work is in progress and it is said that a larger force will soon be put on.

### ILLINOIS.

#### Jackson County.

**Big Muddy Coal and Iron Company.**—This company has made a reduction of 10% in its price for mining coal, and the reduction has been accepted by the miners. The same course will be followed by all the coal companies in the southern Illinois district.

### INDIAN TERRITORY.

(Reported for the "Engineering and Mining Journal.")

**Peoria Mining, Construction and Land Company.**—This company's mining lands are located in the northeast corner of Indian Territory, in what is known as the Great Lead and Zinc Belt, 11 miles south of Galena, Kan., and 14 miles southwest of Joplin, Mo. The lands are secured by leases from the patentees granted by special acts of Congress and run for 30 years. On May 1st, 1892, the company commenced operations, by sinking shafts and also with steam drills, making the first find of lead in a little valley at a depth of 8 ft. in sheet form from 3 to 16 in. thick and 88% fine. This lead was covered with flint boulders and washed gravel in a very compact form and underlaid with what is termed "Cherokee lime" and chert, mixed with, now and then, some lead and zinc. While this find was good, the company wished to know what it had below. It has two shafts 110 ft. and 125 ft. deep, that have proved good. This deep lead and zinc is disseminated and is really a conglomerate mass, which requires to be crushed and separated, while the sheet lead is ready for market when raised, not even requiring to be washed, the lead being all about the same grade. The company has a steam plant on the ground that will wash and clean five tons per hour at a cost of 75 cents per ton. There is considerable water to contend with also in the deep mines, but none in the shallow. There is ample pump machinery to drain the land. Prospecting has been done by the company in quite a number of places covering an area of some three by six miles, in order to test the lands. The company has subleased some 200 acres in 200 x 200-ft. lots and a few in acre lots, from five to ten acres each, to other companies. They work these lands on a royalty. The company handles all ore, buying the same each week and sending by wagon to the Joplin White Lead Works. The output of lead has increased from nothing to 75,000 lbs. per week clean lead, besides zinc and silicate of which we have some good mines, but not worked much on account of low prices. The zinc is 58% average. The depth of the mines is from 8 ft. to 125 ft. and the largest number will average 30 ft. The lead in thickness is

from 1 in. to 5 ft., this last one being a new find at 48 ft. This is considered a bonanza. The company had one piece of lead weighing 6,800 lbs. and another 3,580 lbs. free lead, and 300 to 500-lb. pieces are common in our camp. In addition to this the company owns the largest face of pure tripoli that has yet been discovered, having 40 acres on which the average depth of solid tripoli is 20 ft. and has proved to be fine filtering and polishing stone. In addition to this the company has 1,500 acres of coal as yet only developed with the drill. It has also 5,000 acres of grazing and farm lands well watered and under good fence with 1,500 acres now under cultivation. The company was organized last March at Gloucester City, N. J., where the president lives. The capital stock is \$1,500,000.

### MARYLAND.

**West Virginia Central & Pittsburg Railroad.**—The long-pending suits over the management of this company, which are now before the Maryland Court of Appeals, have been finally settled by agreement. By the terms of this 9,900 shares held by Maj. John K. Shaw and his friends have been transferred to Henry G. Davis, president of the company, and all suits will be withdrawn.

### MASSACHUSETTS.

#### Berkshire County.

**Hudson Iron Company.**—This company has taken out the pumps from its mine, at West Stockbridge. The mine has not been worked for about 16 months, but the pumps have been kept going.

### MICHIGAN.

#### Copper.

**Tamarack Mining Company.**—Two new cylinders have been placed in the large double Allis engines at No. 3 shaft. The old cylinders were 24 x 60 in. and they have been replaced by a pair 28 x 60 in. The putting in of larger cylinders was made necessary on account of the increasing depth of the shaft, which is now down about 3,800 ft.

**Tamarack, Jr., Mining Company.**—No. 2 shaft is now reported working in about 4 ft. of vein. The company is taking out more than enough copper to pay for development work.

**Union Copper, Land and Mining Company.**—This company has been reorganized with \$500,000 capital stock, and intends to work its property, it is said.

#### Iron—Gogebic Range.

**Norrie Mine.**—This mine is running with about half force and the output of the group is about 1,800 tons daily.

### MISSOURI.

#### Jasper County.

(From our Special Correspondent.)

#### Joplin, Feb. 19.

The snowstorm and blizzard of last week caused a general closing down of the mines of this district, so that the production of ore was very light and the sales correspondingly low. The top price offered for zinc ore by the ore buyers was \$18.50 per ton. Some sales are reported for this week's delivery at \$19 per ton. Lead ore opened at \$17.50 per thousand and on Thursday declined to \$17. The Argentine Smelting Company again had an agent in the market and seem anxious to take the soft lead ore for fluxing purposes. Following are the sales of ore from the different camps: Joplin, 555,900 lbs. of zinc ore and 49,000 lbs. of lead, value \$6,000; Webb City, 666,190 lbs. of zinc ore and 33,130 lbs. of lead, value \$6,401; Carterville, 904,450 lbs. of zinc ore and 90,010 lbs. of lead, value \$9,467; Oronogo, 41,330 lbs. of zinc ore and 172,000 lbs. of lead, value \$11,198; district's total value \$33,825; Peoria, Indian Territory, 33,650 lbs. of lead, value \$572; Newton County, 382,730 lbs. of zinc ore and 67,560 lbs. of lead, value \$4,210; Aurora, 1,091,000 lbs. of zinc ore and 296,000 lbs. of lead, value \$11,345; lead and zinc belt's total value \$49,952.

The output of the Aurora mining district for the year 1893 has just been compiled for State Geologist Winslow and shows the production as follows: Lead ore, 7,211,141 lbs.; dry bone, 475,925 lbs.; silicate, 26,850,285 lbs.; blende, 20,672,059 lbs. This product sold for a total of \$471,598; the landowners were paid a royalty of \$77,480.

**Picher Lead Company, Joplin.**—This company purchased about 700,000 lbs. of lead ore at Galena last week and about one-half was delivered Saturday and the rest will be delivered this week.

#### Macon County.

**Little Pittsburg Coal and Mining Company.**—About 100 miners employed by this company, at Lingo, are on strike on account of the refusal of the management to suspend a man who the strikers claim violated an agreement about work.

### MONTANA.

The following patents were last week issued from the land office at Helena:

**Deer Lodge County**—J. R. Marcum et al., for the Republican lode.

**Lewis & Clarke County**—F. S. P. Lindsay for the Florence lode.

**Silver Bow County**—John Helehan et al., for the Cordelia and East Cordelia lodes; Emma Nevada Mining and Milling Company, for the Emma Nevada, Henry Morgan and Farnell lodes; Thos. Curtis

et al., for the Morning Star lode; J. R. Silver et al., for the Comstock lode.

#### Deer Lodge County.

**Hope Mining Company.**—In Helena recently Judge Knowles, in the United States District Court, signed seven decrees settling conflicts between mining claims of the Hope company, of St. Louis, and other people. All the claims are in the Flint Creek district, and the conflicts have been settled by stipulation and agreement between the parties to the suits. The Shapleigh and Constant lodes, owned by the Hope company, conflicted with the Garnet, the Amended Garnet and the Porter Extension lodes, owned by Angus A. McDonald and Eliger Bergeron; while the Shapleigh lode also conflicted with the Hope and High Ore lodes, owned by R. F. Parkman. In these cases the agreement allows judgment to be entered in favor of the Hope company. In the case of the Amended Ohio lode, owned by Henry Knatz and E. Shuh, which conflict with the Constant lode, the agreement allows the claim of the plaintiffs and judgment against the Hope company. These judgments straighten out a long controversy between the Hope company and the owners of other mining claims in the Flint Creek district.

#### Gallatin County.

**Chestnut Coal Mine.**—A dispatch from Bozeman says that Johnson & McCarthy, who have been working this mine, in Rocky Canyon, have struck a seam of coal 9 ft. in thickness, and apparently of excellent quality.

#### Granite County.

**Gold Bug.**—The Phillipsburg "Mail" has information to the effect that Peter and John Sherr and Charles Kadell have bonded their properties, the Bloomington and Gold Bug lodes, to Marcus Daly, of the Anaconda company. The properties are located a short distance from the Royal Gold, in the Boulder district, and are gold properties.

#### Jefferson County.

**Butte & Basin Mining Company.**—In this company's Dimon claim ore has been struck at a depth of 45 ft.

**Copper Bell Mining Company.**—The Edna and Leila claims, owned by this company, are advertised to be sold at sheriff's sale to satisfy a judgment held by James Madden.

**Elkhorn Mining Company, Limited.**—The following is the return for the month of January: Mill worked 29 days and crushed 1,071 tons; bullion produced in the mill, \$24,650; 210 tons of smelting ore sold, \$12,900; total produce, \$37,550; total expenses, \$24,590; estimated profit for the month, \$12,960.

**Freedom Gold Mining Company.**—Incorporation papers have been filed for this company by Robert F. Turner, Patrick O'Connor, Adolph Weststein, Charles Allensworth, Michael Crowley, Jacob H. Beck, George E. Sherman, Louis T. Richle and Wm. H. Davis. The mine is located at the town of Basin.

**Hope & Katie.**—These mines, near Basin, are being worked by Gen. C. S. Warren. Neither mine is developed below 300 ft. On the Katie a 500-ton concentrator is to be built, the plant having already been contracted for.

**Hope.**—This mine, near Basin, is now employing 60 men in the mine and concentrator. The shaft is down 200 ft., with drifts both east and west on the lead. The latter is 20 ft. wide with 18 in. of pay ore.

**Katie.**—This mine, adjoining the Hope on the east, is also owned and being developed by Helena people, the Glass Brothers. The Katie has a shaft down 200, and a body of ore exposed equal in richness to that in the Hope. There are two shafts on the Katie, and in both of them the lead has been struck. In the spring the owners will put up a concentrator, there being enough ore on the dump now to justify this, taken out in development, not counting what is exposed in the mine.

#### Lewis & Clarke County.

**Royal Gold Mine.**—At this mine 42 men are employed. Some rich ore was recently struck in the tunnel.

#### Madison County.

**Easton.**—Work on this mine has been temporarily suspended for the purpose of adding a new roaster and additional crushing apparatus to the plant. The work will occupy about two months, during which time active development work will be prosecuted at the mine.

**Lucas Mining Company.**—This company has settled its outstanding indebtedness and resumed work on the mine near Summit.

The following items are from the Anaconda "Standard" of recent date:

In the Revenue district, on and around Richmond Flats, more activity in mining is apparent than has been seen there for many years past. More mines are being worked and prospects are better than ever before. Among the most prominent are these: Major Budd & Co. are driving a tunnel upon the old Pony lode, which has been a great producer in years past. The major looks for a big vein of high-grade ore in about 50 ft. from present workings. The Arkansas mine is being worked by leasers. They have 12 in. of ore, gold.



Elling & Morris have about 30 men working leases on the Ned, Willow Creek, Iron, Rustler, Strawberry and Keystone lodes, near Pony. These mines have been strong producers in the past, and at the present stage of working show no deterioration in character. The camp is looking generally good.

Geneseo.—Bagett & Co. are working this mine on a lease. They have a strong vein of high-grade ore, and about 40 tons already on the dump.

High Ore Prospecting and Exploring Company.—This company sunk 50 ft. on a good vein of high-grade ore, but at that depth the ore skipped out. They expect to find it again shortly.

Monitor Mining and Exploring Company.—This company reports that they have struck a big body of ore in the upraise, and that it is rich. The vice-president is quite jubilant over the find.

New York Belle.—Curran & Co., of Butte, have a bond and lease on the Emperor and New York Belle lodes. They have a few men at work, but have not yet struck very high-grade ore. In the latter they expect to reach a larger body soon as the indications are quite promising.

Norwood.—Frank Searle has secured a controlling interest in the Norwood group of mines on Granite Creek, four miles from Virginia City. When spring opens he will work them vigorously.

Nova Scotia Mining Company.—This company is working leased property, and reports that the ore is good enough for it; but that is all the information it will give out.

Silver Bow County.

Anaconda Mining Company.—This company, says the Butte "Inter-Mountain," is working the Anaconda, St. Lawrence, Green Mountain, Mountain Consolidated, High Ore and Modoc mines. All the other copper companies are working as usual. The Croesus, Sunnyside, Buffalo and Adelaide mines, all Anaconda properties, are being worked under lease. Three sets of leasers are working on the Adelaide. J. R. B. Coon & Co. have a lease there and have struck some good copper ore. The Wappello, Amy & Silversmith, Goldsmith No. 2, Missoula, Murray Fraction, West Elba, Blackbird, Soudan and Eveline are all producing silver ore.

Baily Placers.—Oscar McKee and L. M. McKee have sold to John Schmidt and H. Dapper, all of Anaconda, an eighth interest in the Baily and Healy placers and an eighth interest in a Bear Gulch water right. The claims are between French Gulch and Moose Creek. The consideration is \$200.

Big Hole Improvement Company.—Articles of incorporation of this company, with W. A. Clark, A. H. Wethey and Charles W. Clark as incorporators, were filed in Butte recently. The capital stock is \$100,000, divided into 20,000 shares at \$5 each. The stock shall be fully paid up and non-assessable. The objects of the company, as given in the articles, are to use and develop water rights, water and electric power, build and operate electric and other railways, use and improve timber, agricultural and mining lands, carry on a lumber mill, business, mining, milling, smelting and concentrating plants, manufacturing, mining and mercantile business, construct and operate reservoirs, flumes and utilizing water for the purpose of manufacture, irrigation, supplying water for towns, corporations, private persons, and to deal in real estate. The operations of the company are to be carried on in Silver Bow and Beaverhead counties. It is stated that the incorporation of the company is one of the preliminary steps toward building a town on the Big Hole River and erecting a big smelter there. A few days ago all the property and interests of the Big Hole Lumber Company were transferred to the new corporation.

Camp Creek.—Mr. J. B. Haggin has bought the Skylark lode claim, a half-interest in the Iron Clad, the Blue Bird Fraction, the Badger, the Copper Cross and a half-interest in the Copper, all located in Camp Creek district. The consideration named in the transfer is \$2,100.

Ground Squirrel.—Suit has been begun by J. B. Haggin against W. T. Lewis and others to settle the title to this claim in Butte. The Anaconda "Standard" says: Nearly all of the defendants have but a surface claim to the property, but the Butte & Boston Company lays claim to the vein itself and the suit will raise a point not heretofore passed upon by the courts. The Ground Squirrel, which the plaintiff owns, formerly was the property of the Blue Bird, and contains a rich body of ore which passed entirely outside of the side lines and into the Butte & Boston property, near the 300-ft. level. The Ground Squirrel is held, it is said, under a placer location as well as the Butte & Boston property, and the latter company claims that the placer law governs in regard to following a vein; that is, that it cannot be followed beyond the side lines. The trial of the case promises to be an interesting one.

NEVADA.

Eureka County.

During the month of January the Eureka & Palisade Railroad Company received in transit to Salt Lake and Vallejo Junction, Cal., 1,226 tons of ore from Eureka district and other mines, as follows: From the Diamond, 747 tons; Eureka Consolidated, 181 tons; Jackson, 105 tons; Richmond, 87 tons; Phoenix, 46 tons; Idaho, 41 tons, and Hamburg,

20 tons. There were no shipments to report from White Pine, the ore teams having all been laid off for the winter.

Lincoln County.

(From our Special Correspondent.)

Keystone Mining Company, Yellow Pine.—The mine, owned by this corporation, was opened a little over one year ago and ore has been extracted regularly since last August. A splendid showing is being made. The 10-stamp mill is being regularly run and gold bullion, valued at an average of \$30,000 a month, is being taken out. The ore is worked to 94% of its assay value and has an average pulp value of \$92.20 per ton.

Storey County—Comstock Lode.

Kentuck Consolidated Mining Company.—The superintendent of this company says in his latest weekly official letter: On the 1,100 level the south drift from the top of the upraise above the north cross-cut is in 15 ft.; face in quartz, with bunches of pay ore. The west cross-cut from the south drift near the south line is in 21 ft.; face in low-grade ore.

Occidental Consolidated Mining Company.—The extraction of ore at this company's mine has been temporarily suspended on account of the freezing of the motor power of the mill, a portion of which is operated by a water wheel. During last week eight tons of ore were milled assaying \$49 per ton. During the month of January a total of 119 tons of ore and slimes were worked resulting in a bullion yield assaying \$1,554.

Occidental Consolidated Mining Company.—The latest weekly official letter says: During the past week eight tons of ore, assaying \$49 per ton, were extracted from the west ledge. The amount of ore and slimes milled in January was 119 tons, producing bullion valued at \$1,554.

(From our Special Correspondent.)

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

Mines.	Ore H's't'd	Car S'mple Assay.	Ore Milled.	Av. Bat'ry Assay.	Bullion for Week.	Total.
Belcher...	8 <sup>1</sup>					
Con. Cal. & Va.	43	33.20				
Chollar...	163	23.41	150	20.51		446 <sup>2</sup>
Crown Pt.	128			22.02		
	12 <sup>3</sup>					
Hale & Norcross	24	35.15				
	26 <sup>5</sup>	20.63				
Occidental	8	49.60				
Savage						378 <sup>6</sup>

<sup>1</sup> Fair grade ore. <sup>2</sup> Crude bullion shipped to Carson. Gold-bearing quartz. <sup>3</sup> Cars of ore.

Consolidated California & Virginia Mining Company.—The interest in the prospective developments, which has been flagging for the past week or two, received new impetus during the current week. Nothing of importance has occurred to warrant this new interest, but all the same upon the operations in the Rule drift all eyes are now focused. The upraise to connect this drift and the winze sunk from the northerly workings of the Best & Belcher will be completed in a few days and then, connection having been made, prospecting will be carried on under much better conditions as regards ventilation, etc., than before.

Crown Point Mining Company.—In the top of the raise from the 300 level a width of 3 to 4 ft. of fairly good quartz is showing. The 123 tons of gold-bearing rock shipped to the mill this week will have its value determined only by practical test.

Potosi Silver Mining Company.—Private advices report encouragingly of the showing on the 450 level, where a good prospect exists in the south drift from the west cross-cut between the Chollar and the old Sharon shafts.

NEW MEXICO.

Grant County.

Only one of the mills at Pinos Altos is now running, says the Silver City "Enterprise." The condition of the roads there is such that it is practically out of the question to haul ore. There is a foot or more of snow on the mountains in the camp and this will put a stop to ore hauling for several days. There is plenty of water in the camp now and as soon as ore hauling can be commenced other mills will be started up.

Manhattan Gold Mining and Milling Company.—This company's tunnel at Pinos Altos is now in about 875 ft., says the Silver City "Enterprise." Of late the ground has been getting softer and water is coming into the tunnel which is taken as an indication that the vein is not far off. It is expected that the company will put on a force of miners as soon as the vein is struck and as soon as the mine can be opened sufficiently to insure a steady supply of ore the mill will be started up again. The vein to which the company is now driving the tunnel is the Pacific vein which is said to be the widest in the camp.

Taos County.

The following items of Amizett mining news are taken from our exchanges:

Chicago.—This property, now being worked by Superintendent B. F. Cardwell for Pueblo, Colo., people, shows an 18-in. streak of ore which runs high in gold. The "Shoshone" lode, which lies next to the Chicago, and is owned by Tarbell, Strong & Harper, is also being worked, and shows a 16-in. streak of gold quartz, which gives from 4 to 6 oz. in gold per ton. The Navajo lode, which is running a tunnel in on the vein, shows 5 ft. of gold ore and from an assay just made gives a return of \$19 per ton. This property is owned by Messrs. Gusdorf, Tarbell, Harper and Strong.

Gold King.—This lode, operated by Charles M. Kittredge, of Denver, has recently cut a 10-ft. vein in its deep workings which gives a return of \$37.50 gold per ton. The company is working to cut the main vein, and will find a still larger vein when this is reached.

Lillian.—This lode, owned by Pueblo, Colorado Springs and Salida, Colo., parties, is expected to commence work soon on its deep tunnel to cross-cut the vein. Trouble over the title of the property has caused the delay. The Lillian has given high assays. The above properties are all located on Gold King hill following the large iron dikes.

Little Charlotte.—This lode, which end-lines with the Navajo, and is owned by Messrs. George, Ormond and Cotton, will soon commence operations to cross-cut for the Navajo vein. The Helen, which is being worked by Denver parties, is running a cross-cut tunnel to cut the gold quartz lead, and is expected to reach it shortly.

Minnesota.—This group, owned by Goodwin George and T. Ormond, has just opened 8 ft. of gold quartz which shows free gold by panning from the surface; no assay has yet been made.

OHIO.

The settlement of the price for mining coal seems practically to have been left to the different districts. In the Hocking Valley work is going on at the reduced price, but in the Massillon district the mines are generally closed down and the men will not accept the reduction.

The settlement proposed by the coal miners is on the general basis of 50 cents per ton for pick mining and 7 cents for machine mining. The coal operators are, it is said, willing to agree to the 50-cent rate, but want a reduction to 5¼ cents for machine work, which the miners are not willing to concede.

OREGON.

Baker County.

Shelton Mine.—Development work is being carried on steadily on this mine and some very good ore has lately been taken out.

Josephine County.

Wolf Creek.—At this point Mr. Wm. H. Hampton, for himself and partners, has been carrying out one of the largest operations at present in the State. The contract was let October 1st, and October 15th work was started. The ditch is 15.7 miles in length. There has been on an average 250 men employed during that time and it is now nearly completed. The ditch is 7 ft. wide on top, 4 ft. on bottom and 3 ft. deep with 0'03 ft. to the rod grade; it will carry 3,000 in. of water. The average cubic contents is a yard to the lineal foot. This has been built under Mr. Hampton's supervision and there have been employed besides trestle gangs, sawmills, etc. It will shortly be in operation at an expense of about \$35,000. The property is situated on Tom East Creek, a tributary of Grove Creek. The ditch head is 8½ miles by trail from the mine, the water is taken from Grove Creek and the present terminus of the ditch is 1,000 ft. above the creek. The property includes about 1,200 acres of land. The mine has been a good producer in the way it was worked, and was known as the Joe Dysart mine.

Linn County.

Albany Mining and Milling Company.—A Portland dispatch says that the property of this company, in the Santiam district, has been sold to Thomas G. Drew, owner of the Hammersley mine, and C. G. Clark for \$140,000. The mine, which is low-grade gold, comprises 13 claims and has 3,500 ft. of tunnel. The plant will be doubled and chlorination works added.

PENNSYLVANIA.

Allegheny County.

Chartiers Valley Gas Company.—At the annual meeting in Pittsburg recently, President H. Sellers McKee presented his annual report, which showed that during 1893 the gross receipts were \$194,056, and the expenses were \$40,131. A reduction of \$153,375 was made in the net debt of the company.

Manufacturers' Natural Gas Company.—At the annual meeting in Pittsburg recently, the reports for 1893 presented showed that the gross earnings of the company for the year were \$240,565, the expenses, \$119,433, leaving a net earning of \$121,132. Fixed charges aggregate \$12,136; surplus earnings, \$108,996. The cash receipts from mills were \$1,546 and from glass factories, \$107,688. The pipe lines of this company aggregate something over 150 miles.

Anthracite Coal.

All of the collieries in the Mahanoy Valley, excepting Bear Run and St. Nicholas, resumed operations on February 19th.

Delaware, Lackawanna & Western Railroad Company.—At the annual meeting in New York,

February 20th, the following were elected: President, Samuel Sloan; managers, John I. Blair, George Bliss, Percy R. Pyne, William Waldorf Astor, William Rockefeller, Eugene Higgins, Henry A. C. Taylor, J. Rogers Maxwell, George F. Baker, James Stillman, Alexander T. Van Nest, H. McK. Twombly, Frank Werk and H. C. Fahnestock; secretary, Frederick F. Chambers; treasurer, Frederick H. Gibbens. Messrs. Fahnestock, Twombly and Werk are new members of the board and represent the Vanderbilt interest; they replace W. H. Appleton, R. F. Ballantine and A. H. McClintock.

**Lehigh Coal and Navigation Company.**—A dispatch from Easton says that this company is getting ready to open its canal in March and is finishing up the work of repairs which has been carried on during the winter. The most important work was on the Delaware division, near Point Pleasant. The old wooden aqueduct built in 1869, which crossed the Tobickon Creek, was torn away and in its place is being erected an iron structure 206 ft. long. It is being lined with wood and will be 23 ft. wide at the bottom, 25 ft. at the top and carry a depth of 6 ft. 3 in. of water. This will accommodate two boats and will remedy the many annoyances experienced by the old aqueduct, which was only wide enough for one boat. The company has also built a new aqueduct over a large mill dam at New Hope. The total outlay for improvements of this character has reached nearly \$20,000.

**Philadelphia & Reading Coal and Iron Company.**—A press dispatch from Shenandoah says that this company's collieries there and at Turkey Run, Elmwood, Suffolk and Hammond, resumed operation on February 19th, after an idleness of six weeks, giving employment to 2,000 men and boys.

#### Bituminous Coal.

It is reported the miners of the fourth pool have again yielded to a reduction. This time they have accepted a reduction to  $1\frac{1}{2}$  cents per bushel. This is considered almost the last straw, but the miners are waiting for the time when they can demand and enforce an advance. It has not been long since they were earning  $2\frac{1}{4}$  cents a bushel. They were afterward cut to  $1\frac{3}{4}$  cents and now they are obliged to take  $1\frac{1}{2}$  cents per bushel. This rate is equal to about 2 cents in the other pools and an energetic worker can make from \$1.50 to \$2 per day.

#### SOUTH DAKOTA.

##### Lawrence County.

**Bare Butte Mining District.**—At the head of Two Bit Gulch, in Bare Butte mining district, there are a dozen or more small veins of high-grade silver ore exposed in the workings of several locations, says the Deadwood "Times." The veins are vertical, averaging in width from 1 to 4 in. and ranging in value from 150 to 500 oz. silver per ton. These veins or seams apparently are feeders from the quartzite which exists at a considerable depth and come up through fissures or breaks in a very hard, grayish porphyry. The ore alternates from a quartz to a galena ore, the former showing to the naked eye a large amount of horn silver and chlorides. The owners of these claims have not as yet obtained any depth, the development work being confined to open cuts and tunnels driven along the course of the vein. On one of these claims, owned by E. Teeters, called the Mondano, a 40-ft. shaft has been sunk, in the bottom of which a 4-in. seam of high-grade quartz is exposed. A tunnel is now being driven to intercept this seam at a greater depth. During the progress of the tunnel Mr. Teeters secured about a ton of ore in every 10 ft. driven.

**Caledonia Mining Company.**—About 20 men are now employed on this property in running drifts and sinking the double compartment shaft 50 ft. deeper to connect with an upraise from the 600-ft. level, to be made from a drift from the Giant and Old Abe workings, says the Deadwood "Times." Connection was made some days ago with the same workings on the 500-ft. level. This work is purely prospecting and, according to one of the men employed, a good body of ore has already been opened up, with indications of its being extensive. The work now under way is being done with power drills, compressed air being utilized. The hardness of the rock may be imagined from the fact that some of the shifts have only been able to drill 12 ft. A report is current that when the company resumes operations the ore will be crushed on the Lead side of the divide and all the mills now in Terraville moved to the plot of ground near the settling dam on Gold Run, recently purchased from J. H. Skelly and James Connors.

**Homestake Mining Company.**—This company has declared No. 187, of 15 cents per share, payable February 26th, at the New York office. This dividend amounts to \$18,750, making \$5,118,750 paid in dividends to date.

#### TENNESSEE.

**Ohio-Tennessee Coal and Lumber Co.**—This new company owns 10,000 acres of land in Scott and Pentress counties. The business headquarters will be in Cleveland, O., and the Tennessee office at Huntsville, at which place Mr. H. Reed will be the company's representative. The organizers and incorporators of the company are F. B. S. Morgan, W. N. Taylor, P. N. Taylor and H. L. Morgan, of Cleveland, O., and E. J. Collins, of Philadelphia, Pa. Work will be commenced at the company's property about April 1st, when sawmills will be

built to utilize the timber on the company's claim. A Western and Eastern market will be made for the coal mined. The promoter of this company is Capt. F. B. S. Morgan, who has been interested in many Southern enterprises.

#### UTAH.

##### Salt Lake County.

The shipments of ore and bullion from Salt Lake City for the week ending February 10th were as follows: Bullion, 677,454 lbs.; silver and lead ores, 1,272,250. The receipts of ore and bullion at Salt Lake City for the week ending February 14th were to the aggregate value of \$135,514, of which \$99,614 was in bullion and \$36,900 was in ore. The receipts of Pennsylvania bullion amounted to \$19,899; Hanauer bullion, \$8,100; base bullion, \$29,200; Ontario bullion, \$15,014; Daly bullion, \$9,211; silver bars, \$2,200; sulphides, \$16,000. Ore receipts were \$19,700 by McCormick & Co. and \$17,200 by T. R. Jones & Co.

**Niagara Mining and Smelting Company.**—We are advised officially that during the week ending February 10th, 38 ft. was added to the Niagara tunnel, making the total distance driven at that date 1,098 ft. 6 in. The cross-cut tunnel being driven from Silver Hill Gulch into the Spanish mine, for the purpose of cutting the vein 100 ft. below the present workings, is now in 300 ft. and the character of the ground is reported softer and indications good for finding the vein. It is believed that the lode is not very far away from the present face of the cross-cut tunnel. About 100 tons of crude ore from the new strike in the Spanish was shipped last week, the total amount assaying  $17\frac{1}{2}\%$  lead, 10 oz. silver and \$8 gold per ton. Steady shipments from this new ore body are expected to continue.

#### VERMONT.

##### Washington County.

In the numerous granite quarries about Barre an unusually large number of orders for spring work is reported, and full forces will generally be employed as soon as the weather permits.

#### VIRGINIA.

##### Buckingham County.

**Bosney Iron Company.**—At the annual meeting at Bosney last week, this company elected the following directors and officers: P. J. Bennett, F. T. Shaw, Dr. J. H. Billingsley, John H. Walters, Chas. T. Reifsnider, John L. Reifsnider, directors; F. T. Shaw, president; Dr. J. H. Billingsley, vice-president; Chas. T. Reifsnider, secretary; John L. Reifsnider, treasurer and assistant manager; John H. Walter, manager; E. W. Hubbard and Chas. T. Reifsnider, attorneys. The company is making arrangements to resume work shortly on its own mines, which have been shut down since August last.

##### Wise County.

**Looney Creek Coal and Coke Company.**—This company, in which L. D. Pettit and J. C. Blair are chief owners, have leased from Clyde, Scott & Haskell, of New York, 1,400 acres of coal lands on Looney Creek, three miles from Big Stone Gap. The company will develop the coal and put up coke ovens.

#### WASHINGTON.

##### King County.

(From our Special Correspondent.)

**Renton Coal Mining Company, Renton.**—The mine, belonging to this San Francisco corporation, is situated conveniently to Seattle, the latter town being only eight miles distant, but has been closed down for some time. So many vessels arrive at San Francisco ballasted with coal, in order to take wheat cargoes, that the mine could not be worked at a profit. In consequence of this state of affairs not promising any improvement, the company is about to wind up and retire from the business field. The company incorporated with a capital stock of \$300,000 and began business in 1876. The officers and directors are: J. W. Bushnell, president; D. D. Stark, secretary; and A. M. Simpson, J. W. Bushnell, D. D. Stark, J. D. Roch and J. Whitworth. The stockholders will get their stock paid in full; all creditors will receive 100c. on the dollar, but Mr. Simpson, who is by far the largest stockholder, will probably suffer. The six bunkers at Oakland, having a capacity of 1,400 tons, have been sold to Rosenfeld & Sons, and the retail business as well as the anthracite contracts have been disposed of. Only the mine remains and what disposition will be made of it is not now known.

#### WEST VIRGINIA.

##### Jackson County.

**Murraysville Oil and Gas Company.**—A charter has been granted to this company to sink oil and gas wells near Murraysville. The incorporators are: T. C. Murphy, of Ravenswood; J. C. Dewitt and William Roberts, of Muses' Bottom; G. F. Douglas, J. J. Howell and J. L. Hayrow, of Murraysville. The capital stock is \$10,000.

##### Wood County.

**Ohio River Oil Company.**—This company has been chartered at Parkersburg, with a capital of \$15,000. The incorporators are: A. A. Hopkins, of Pittsburg, Pa.; Charles W. Brown, E. Sarre, Olive B. Sarre, of Stroudsburg, Pa.; and J. B. Chapman, of Pittsburg, Pa.

#### WISCONSIN.

##### Iron-Gogebic Range.

**Cary Mine.**—This mine, near Hurley, is being worked steadily with about half its full force.

#### WYOMING.

##### Carbon County.

**Le Garde Placers.**—A rush to this section is reported, and it is stated that all the ground from the Laramie River to Shipman Park has been staked.

##### Fremont County.

(From our Special Correspondent.)

The last two weeks have been exciting times at Lewiston, a very important gold camp in Fremont County.

At South Pass, Atlanta and Miners' Delight, the first and most noted gold mines in Wyoming, there are several companies arranging for extensive development during the coming season.

**Lander Mining and Milling Company.**—This company has found several bodies of gold ore.

##### Natrona County.

(From our Special Correspondent.)

**Pennsylvania Oil Company.**—This company, which owns oil lands on Salt Creek, has erected large storage tanks at their wells and one 500-bbl. tank at Casper, on the Fremont & Elkhorn Valley Railroad. This company is the first to put Wyoming petroleum on the general market and is now prepared to make regular shipments, as two companies in the East, one in Connecticut, and one in Virginia, are using their oil as a lubricant. The oil is one of the best natural lubricants found. It has a gravity of 9100, containing less than 2% of kerosene and lighter oils and a very small percentage of coke.

##### Uinta County.

(From our Special Correspondent.)

Two companies are arranging to open up the sulphur deposits of Uinta County. Assays on the crude ore vary from 40 to 80% of pure sulphur.

#### FOREIGN MINING NEWS.

##### NEW SOUTH WALES.

**Broken Hill Proprietary Company.**—The report presented at the half-yearly meeting in Melbourne, states: The chloridizing plant, consisting of 10 furnaces, has so far approached completion, as regards six of them, as to enable these to be put in blast for a preliminary trial. It has, however, been found necessary to effect certain changes as to the mechanical arrangements for the handling of the ore, which alterations are now in course of being made, and so soon as these have been satisfactorily arranged, and proved by results, the completion of the balance of the furnaces can be easily and expeditiously carried out, the whole of the machinery being on the ground, and the foundations already laid. Several discoveries of an important nature have been made during the past six months, principally in regard to carbonate of lead ore, of which a valuable and independent body has been opened up parallel to the main lode, and in the vicinity of Darling shaft—thus adding considerably to the reserves of this class of ore. A cross-cut to the west was driven from the 800-ft. level, McBryde shaft, and at 110 ft. work was stopped by the very heavy flow of water, showing that the lode had been reached, but so far the water had been too strong, and has consequently prevented anything being ascertained as to its value. Work in connection with the open cut is being carried on systematically, and has been still further extended, and an enormous quantity of ore has been obtained from this source at a low cost, thus considerably reducing the cost of production per ton of ore. Although the whole of these operations are being pushed on as quickly and as vigorously as they can be, yet, after 13 months' work, they are only down 50 ft., so that it will take some considerable time to reach the 200-ft. level, as intended. The balance sheet presented shows that the company has effected a substantial reduction in working costs, thus minimizing the loss sustained through the fall in the price of silver. The net profit for the half-year amounts to £453,632, out of which sum £288,000 has been distributed in dividends, and £30,000 added to the reserve fund, thus increasing it to £110,000.

##### NOVA SCOTIA.

**Dominion Coal Company.**—At the annual meeting in Boston, February 15th, directors were elected as follows: Henry F. Dimock, Hugh McLennan, F. S. Pearson, W. B. Ross, Sir Donald A. Smith, W. C. Van Horne, Henry M. Whitney, Alfred Winsor and Robert Winsor.

##### PERSIA.

**Persian Bank Mining Rights Corporation.**—At a recent meeting of this company in London a very discouraging report as to mining operations was presented. The directors stated that they had invited Mr. Mactear to go out as an expert, visiting all the works in the north of Persia, and giving his opinion of what would be profitable and what would not. His reports were unfavorable to some of the corporations and favorable to others. The directors placed great reliance upon the quicksilver in the district of Afshar. That had disappointed them thoroughly, and they had also been disap-



pointed in the engineer who was placed in charge. With regard to copper, they had certainly stopped work at the place where they first attempted it—Gurkhani—but the whole of the district of Sabzwar was a copper country, and if they had received any support from the Persian Government, instead of obstruction and blackmail and the terrorism of their workmen, they would have tried copper working in other places. They had the machinery, and they had only to select some place where there was a sufficient supply of water, and where the work now carried on by native miners showed that copper existed in profitable and workable quantities. They had failed to find petroleum at Daliki, and they had also failed on the Island of Kishm, where they had sunk wells; but they had also been stopped there by the obstruction of the Persian Government. There were many things which might with profit be taken up in Persia which the corporation had not yet exploited with any effect. It was proved that there was petroleum of good quality in the neighborhood of Teheran, as also in a place called Semnan, which had been tested by Mr. Mactear, and found to be of excellent quality. The copper deposits existed in the neighborhood, and the Shah had long interviews with Mr. Mactear on the question of the examination of the country for gold, which he expressed a desire that the corporation should work for him. Mr. Mactear, from the experiments which he had made, considered that this might be profitably prospected, and samples had been found in sufficient quantity to warrant the belief that some portion of the deposits was fairly rich, and that a proper search might result in obtaining quartz veins carrying gold. The corporation is to be wound up shortly.

QUEENSLAND.

The gold returns of the colony of Queensland for the year just ended show a total output of 600,327 oz., being a decrease of 15,231 oz. on the previous year. The output for the latter half of the year just ended, however, shows an increase of 881 oz. over the first half of the year, the totals being 299,723 oz. and 300,604 oz. The principal yields for the year were: Charters Towers, 256,352 oz.; Rockhampton, 114,039 oz.; Gympie, 78,966 oz.; Croydon, 71,120 oz.; Etheridge, 29,236 oz.; Ravenswood, 9,286 oz.; Gladstone fields, 7,666 oz.; Eidsvold, 7,328 oz.; Palmer, 7,175 oz.; Clermont, 4,963 oz.; Herbontion fields, 4,159 oz.; Paradise, 2,491 oz.

Charters Towers.

Brilliant Extended.—This company's shaft has now reached a depth of 2,010 ft., and has cut the Brilliant vein at a point 800 ft. below the deepest workings. The vein shows free gold and so far has been found to run from 2 to 3 ft., the ore being similar to that found in the upper workings.

SOUTH AUSTRALIA.

(Special Correspondence of the "Engineering and Mining Journal.")

It may not be out of place here to give briefly a few facts relating to our colony. South Australia is not the best selection that might have been made of a name for this province, as it is not the most southerly portion of the great island continent of Australia, but occupies nearly the center of it, from the Indian Ocean on the north to the southern ocean in the south, being bounded on the west by West Australia and on the east by Victoria, New South Wales and Queensland. The colony comprises about 903,690 square miles of territory, over a very large portion of which minerals of one kind or other are found. The northernmost point is about 12° S. lat. and the most southerly, on the Victorian border, about 38° S. lat., the extremes being 26° apart. The western boundary is at 128° E. long., and the average breadth of the province is nearly 9° from west to east. Probably nearly every known mineral and metal is found in some portion of Australia, and though our colony has thus far been less productive of the precious metals than our neighbors in the east and west, the extent of country over which gold is diffused is surprising. Several rich patches have been discovered at intervals ever since the year 1845. With a few breaks gold may be found from near the south coast right through to Port Darwin in the Northern Territory on the shores of the Indian Ocean. This territory contains some very rich gold reefs, but most of the best known have been bought and are being worked by Chinamen. This is owing in a great measure to the apathy displayed by capitalists in reference to the gold mines and want of capital on the part of the discoverers. We have any amount of gold in reefs at the rate of from 3 dwts. to 8 dwts. to the ton and a considerable quantity, held in refractory combination with other metals or minerals, in which the gold exists at the rate of from 1 to 3 or 4 oz. to the ton, and occasionally more. Our alluvial diggings have been of limited extent, but occasionally very productive. Some have yielded a number of nuggets from ½ oz. up to 30 oz. in weight. The oldest, and perhaps most productive, of our diggings has been the Exchunga field, 20 miles southeast from Adelaide. It was discovered about 1851 and for some few years supported a digging population of 500 to 600. Up to the present time it has never been entirely deserted. A few diamonds were found there, in all about 120, varying in value from \$2 or \$3 to \$250; that of the last-named price was a very hard and brilliant gem, but of a pale straw color, which detracted from its value. It is strange that in our latest goldfield, 630 miles north of this

city, a diamond was found weighing 3¼ grains, a perfect crystal having brilliant facets, without any appearance of the usual skin, but, unfortunately, of a pale smoky tint. In the MacDonnell Ranges, near the center of the continent, small gems have been found. Mica is also obtained in this district in plates of very large size—as 42 x 30 in., and of good quality.

VICTORIA.

The development of the auriferous areas of Victoria was assisted during 1893 by the strong stimulus coming from the collapse of other industries, says the Australian "Mining Standard." On the other hand, it received a setback from the bank suspensions, which locked up the funds of many companies; and from the West Australian boom, which diverted much capital from Victorian ventures. Nevertheless, the year just passed has been marked by an unwonted activity in the mining industry. Old fields have again sprung into favor, and fresh ground, too, has been broken, and here and there the welcome nugget rewards the persevering fossicker. The new year should witness the fruition of many plucky efforts initiated in the old; and at any rate, the outlook is hopeful. Mining is the one lusty and flourishing calling in Victoria. It last year added to the world's wealth a sum of nearly £2,670,000, represented by, approximately—for accurate returns are so far unavailable—666,500 oz. of gold. This yield exceeds that of 1892 by over 12,000 oz., and is the largest since 1885, when the sum was 783,671 oz. To the total above given, Ballarat and Bendigo, of course, contribute the lion's share. Leaving those great centers out of calculation for a moment, we may refer to the Gippsland district, which includes Omeo, Woods' Point, etc. The discovery of Foley at the latter place almost rivaled Coolgardie; and though apparently not a permanent lode, it proves that the researches of the pioneers did not exhaust the riches of that locality. The old Morning Star is about to be revived, and within the next few months this famous point may be once more the scene of much activity. The Omeo district is spoken of by capable judges as one of the most promising in the colony. Good work is being done there on various claims, and the reported yields so far have been remarkably rich.

Ballarat Central.—The yield of gold from this division for the quarter ended December 31st was as follows: Quartz, 51,328 tons, 19,801 oz., giving an average of 7 dwt. 18'01 gr. per ton; pyrites and blanketing, 403½ tons, 853 oz., an average of 2 oz. 2 dwt. 6'36 gr. per ton; alluvial, 728 oz.; total, 21,472 oz. The amount of gold purchased by seven local banks was £31,306. The number of miners employed was: In Alluvial, Chinese, 88; Europeans, 40. Quartz, Europeans, 2,611; Chinese, 137; total, 2,788.

Bendigo District.—The result, as shown by the balance sheets of the mining companies of this district for 1893, is, according to the "Mining Standard," as follows: Gold, 214,366 oz.; calls £152,091; dividends, £248,005; while for the year 1892 the results were: Gold, 199,294 oz.; calls £132,118; dividends, £268,263. It will thus be seen that while £6,000 worth more gold has been produced, the dividends are something like £20,000 less than last year, while the calls exceeded those of the previous term by a like amount. This does not by any means imply that mining has become more expensive in the meantime, but that a large addition has been made to the area upon which mining operations are being carried on, several miles of new country having been taken up during the year; and should a fair percentage of success be achieved, these ventures should tend to considerably increase the output for the coming year. The output is the largest recorded for eight years.

WEST AUSTRALIA.

As our knowledge of the goldfields of West Australia accumulates, says the Australian "Mining Standard," it is very evident that impressions and opinions formed a few months ago must submit to modification. The glowing and exaggerated reports received from Coolgardie, for instance, in the throes of the excitement attendant upon the discovery of Bayley's, in the light of later information will not hold water, nor are they any longer viewed with reliance. At the same time, it must be admitted on all hands that Coolgardie and the Murchison are remarkably rich auriferous areas, the like of which was before unknown in Australia; and which, if developed with judgment, and the constant idea that mining is an industry, and not a mere speculative pursuit, will largely assist in the year just entered upon to disperse the clouds of depression. The West Australian Government is evidently becoming daily more alive to the opportunities before them, and to the welfare of the hundreds of individuals who are flocking to their territory from the remotest corners of Australasia. Their past inaction, however, is to be regretted. How much more would the comfort of those journeying over the tracks from Southern Cross have been secured, to say nothing of the wider advantages to be bestowed, if a temporary telegraph line had been erected to Coolgardie, and if greater expedition had been displayed in the laying of a light railway line into the back country. The difficulties in neither case are unsurmountable, and any extra cost incurred would have been more than compensated for in the increase to the public revenue. Another matter requiring urgent attention is the water supply and sanitation of Coolgardie. No doubt the aridity of

the place has been magnified and overestimated. A country so well timbered as that appears to be must have a greater rainfall than is represented, and in the opinion of men who have visited the field, a scheme of conservation is all that is required. We are told that the country is admirable for dam making, and this being so no time ought to be lost in providing a water supply for the goldfield. The government evidently recognize this. It has been decided to purchase steam scoops for the purpose of sinking the necessary tanks, and more lately we learn that Mr. Jobson, who had charge of the Stephen's Creek waterworks, at the Barrier, has been appointed to construct and supervise the scheme.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 23.

Statement of shipments of anthracite coal (approximated) for week ending February 17th, 1894, compared with the corresponding period last year:

	1891. Tons.	1893. Tons.	Difference.
Wyoming region.....	278,432	483,897	Dec. 205,467
Lehigh region.....	93,475	120,545	Dec. 27,700
Schuylkill region.....	189,539	238,788	Dec. 44,249
Totals.....	5 1,446	843,212	Dec. 281,766

Total for year to date... 3,899,245 5,270,918 Dec. 1,371,203

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending February 17th and year from January 1st:

	1893.		1893. Year.
	Week.	Year.	
Shipped East and North:			
Phila. & Erie R. R.....	676	6,342	191.8
Cumberland, Md.....	62,573	37,025	435.24
Barelay, Pa.....	478	3,177	11.641
Broad Top, Pa.....	87.9	50,533	107.485
Clearfield, Pa.....	57,931	436,538	546.7.9
Allegheny, Pa.....	27,068	179,477	145.171
Beech Creek, Pa.....	53.9.1	343,879	372.246
Pocahontas Flat Top.....	40.7.8	337,614	333.223
Kanawha, W. Va.....	46,721	3,3932	429.944
Totals.....	299,215	2,078,020	2,357,293

	1891.		1893. Year.
	Week.	Year.	
Shipped West:			
Pittsburg, Pa.....	25,257	174,477	184.999
Westmoreland, Pa.....	23,121	20,915	29.467
Monongahela, Pa.....	10,416	58,973	111.575
Totals.....	58,834	438,355	5,6941

Grand totals..... 358,049 2,516,375 2,934,234

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending February 17th, 1894, and year from January 1st, in tons of 2,400 lb.: Week, 60,223 tons; year, 493,881 tons; to corresponding date in 1892, 701,610 tons.

Anthracite.

There is nothing new to report of the anthracite coal trade this week. The market continues without any change of importance, the same general conditions prevailing now which have characterized it for several weeks past.

Producing interests are fully alive to the importance of keeping the output well in hand, and the restriction in the tonnage is rigidly maintained. All producers have been and are working with this fact in view, so the situation in so far as that is concerned is exactly the same that we have been reporting from the first of this month.

In the matter of prices there is nothing to say excepting that our last week's quotations are being maintained. They continue on the basis of \$4 for stove and chestnut. Egg has been in better demand owing to the continued scarcity of pea, and buckwheat is selling from \$3.60@3.90 on board. Grate sells at \$3.40@3.75. Pea and buckwheat are naturally very scarce, and it is almost impossible to give any fair quotations on them.

The market has continued quiet. As time wears on and spring draws near sellers cannot look forward to cold weather spells to bring relief to the trade by stimulating buying. March is always a heavy tonnage month, but this year it looks as if the usual good business will not be done until that month is nearly ended.

The Reading official circular rates, subject to the usual commission, are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut
Pard white ash.....	\$4.00	\$4.10	\$4.40	\$4.40
Free white ash.....	3.90	4.00	4.40	4.40
Schumokin.....	4.35	4.60	4.40	4.40
Schuylkill red ash.....	4.35	4.75	4.55	4.55
Lykens Valley.....	5.00	5.65	6.00	6.25

The Reading Railroad reports that its coal shipment (estimated) for last week, ending February 17th, was 145,000 tons, of which 10,000 tons were sent to Port Richmond and 28,000 ton were sent to New York waters.

The Bureau of Anthracite Coal Statistics makes the following statement of shipments of anthracite coal for the month of January, 1894, compared with the corresponding period last year, compiled from the returns furnished by the mine operators:

	1903. Tons.	1891. Tons.	Difference.
Wyoming region.....	1,875,394	1,402,025	Dec. 473,369
Lehigh region.....	477,911	430,191	Inc. 47,720
Schuylkill region.....	76,633	850,587	Inc. 3,97
Totals.....	3,569,979	2,622,808	Dec. 443,771

Total stock of coal on hand at tidewater shipping points on January 31st, 1894, was 881,550 tons; a month previous it was 728,878 tons, showing an increase of 152,672 tons, notwithstanding the reduced output during the month.



NOTES OF THE WEEK.

The Philadelphia "Ledger" says that the Lehigh Valley Railroad is reported to be looking ahead, with a view to increasing its Western business, and has recently secured some property at Western lake ports for distributing coal to other interior points.

The abstracts of the annual reports of the Lehigh Coal & Navigation Company, the Dominion Coal Company and the Consolidation Coal Company will be found elsewhere in this issue.

The first step toward the reorganization of the Philadelphia & Reading Railroad was taken on February 20th, when the receivers of the Philadelphia & Reading Coal and Iron Company (the interest of both corporations being identical) filed a petition in the United States Circuit Court, before Judge Butler, asking for permission to issue \$5,000,000 of five-ten-year 6% coal trust certificates secured by coal and coal accounts now held by the Finance Company of Pennsylvania. Judge Butler referred the matter to Special Master Crawford, who will make a report thereon to the Court. The petition states that Drexel & Co. and Brown Bros. & Co. have agreed to purchase one-half of the issue at 97½% of the par value, and that John Lowber Welsh, one of the receivers, has agreed "subject to the approval of the Court," to take \$250,000 of the bonds. The proceeds will be partly used to take up the Speyer loan of \$2,500,000, which will mature on April 3d.

The receivers of the Philadelphia & Reading Railroad Company have presented a petition in the United States Circuit Court at Philadelphia asking to carry into effect an arrangement for the purchase, by the company, of a large steam tug and 10 coal barges. The builders are the William Cramp & Sons' Ship and Engine Building Company. The tug is to be of a capacity of 1,500 to 1,700 tons. The 10 barges are to have a carrying capacity of 1,500 tons each and cost \$31,000 apiece. It was related that the receivers had negotiated a loan upon securities of the tug and barges in consideration of a commission of 5% at the rate of 6% per annum, payable in monthly installments, provided that 20% of the cost be paid in cash and that the loan be secured by a lien upon the tug and barges, and that \$100,000 mortgage bonds of the Philadelphia, Harrisburg & Pittsburgh Railway Company be put up as additional security. It was also stated that John Lowber Welsh, one of the receivers, has agreed, subject to the approval of the Court, to take an interest in said loan. Judge Butler referred the petition to Special Master Crawford to hear the testimony and report.

Bituminous.

There is a slight change for the better in the bituminous coal trade, but it is very slight indeed. There are a few more transient orders coming into the hands of shippers that enable the mines to run regularly to a small extent. The trade, however, is in a miserable condition; it looks like a case of "dog eat dog"—with the cost of production high from the small shipments, and all producers cutting badly into their limited profits.

There is a large number of cars along the lines of the main line roads, but they are handled so as not to create any blockade, and the transportation to and from mines is fair, although not as good as in the summer time.

The trade is slightly improved east of Cape Cod, though the bulk of the business is still done "this side of the Cape."

There is no contracting as yet. The feeling is that the present year will be a backward one in this respect. It is rumored that two or three of the favored shippers from the main line roads have been told of a coming reduction in the seaboard rail rate, but this lacks confirmation.

Usually at about this time of the year there is some talk of a revival of the Seaboard Steam Coal Association, for the purpose of giving some stamina to the trade, but this year there has been none. The coal men apparently have put all their efforts into the American Coal Trade League, for the purpose of meeting the proposed tariff reduction. Later, this league may be used to give backbone to the trade, but it does not look it, irrespective of the fact that it is probably too late now, the contract season being near by.

The coastwise vessel market is pretty well demoralized, and vessels, both large and small, are seeking anxiously for freights. We quote the following rates of freight from Philadelphia: To Boston, Salem, Portland and Portsmouth, 75c. along-side; Sound ports, 65c.; Bath, 75c@80c.; Wareham, 85c. From Baltimore, Newport News and Norfolk, 5c@10c. higher.

All-rail business is fair; local business is, like the rest of the trade, slightly improved.

Boston. Feb. 21.

(From our Special Correspondent.)

The action of the anthracite coal agents in reducing the accepted market prices on coal to \$4 on stove and chestnut, \$3.75 on egg and \$3.65 on free broken was just as anticipated. It simply made public the prices at which anthracite coal had been selling for the fortnight previous. The next reduction will in all probability mark the opening spring prices, though it is yet rather early to make them.

The demand for hard coal throughout New England is extremely light, the recent cut only tending to make buyers hold off all the longer from making

any purchases. The individual companies are undercutting the companies by about 10c. per ton.

The company's net prices, New York, are: Stove and chestnut, \$4; egg, \$3.75, and free broken, \$3.65. Individuals' white ash coals can be had as follows: Stove, \$3.90; egg, \$3.65; free broken, \$3.55; chestnut, \$3.90; Lykens Valley (at Philadelphia), broken, \$4.90; egg, \$5.55; stove, \$6; and chestnut, \$5.25.

No part of the country, except it be the Pacific coast, is more interested in the outcome of the tariff on soft coal than New England. It is too early as yet, however, to predict results. As for the existing market, there is very little doing. Prices are lower in consequence of a decline in freight rates. Cumberland on cars here is worth \$3.50; New River and Pocahontas, \$3.40@3.50, and Clearfield, \$3.20@3.30.

Freight rates are lower than they have been in months. They are as follows: From Philadelphia to New Haven, Allyn Point, New London, Fall River and Providence, 65c.; to Boston, Salem and Portland, 70c.; to Portsmouth, 75c.; to Newburyport, 85c. From Newport News and Norfolk to above-mentioned points about the same rates prevail. From New York 50c. for barges and 60c. for vessels; from Baltimore, 80c.

In a retail way trade is very quiet, the weather here is so wretchedly unseasonable. Prices are steady, however. Boston retail prices are: Stove, \$6.25; nut, \$6.25; egg, \$6.00; furnace, \$5.75; Franklin, \$7.75; Lehigh egg, \$6.25; Lehigh furnace, \$6.00, and soft coal \$4@4.25.

Buffalo. Feb. 22.

(From our Special Correspondent.)

The conditions affecting the anthracite coal trade remain unchanged—prices without variation; demand light; only for home consumption and to fill a few orders from near-by villages and towns.

Bituminous coal is quiet, manufacturers still hesitating about increasing their products. Quotations nominally without variation, but buyers have the best of the bargains.

Our Board of Public Works intends discontinuing the use of natural gas at the Water Works. Bids were asked for 1,200 tons of good quality bituminous coal, and the lowest offer was \$1.83 per ton. The Board expect to save over \$50,000 a year by the change. A Chicago firm is putting in a smoke-consuming apparatus, so that the nuisance attending the burning of soft coal will be prevented. On Monday last the supply of natural gas gave out for two hours without any warning, and there was much trouble experienced.

The case of the Buffalo Creek Railroad Company against Messrs. E. L. Hedstrom and J. J. McWilliams, on the matter of car service demurrage, which is creating great interest among the coal and railroad men of this city and other localities, was continued before Justice Haight yesterday after a motion for a non-suit had been denied. A large number of witnesses have been subpoenaed. The case will probably be a lengthy and tedious one.

Chicago. Feb. 21.

(From our Special Correspondent.)

Another week of poor business has passed in the Chicago coal trade. A close observer might say that the week has developed a slightly increased business, but in order to have such a statement from the average dealer, business will have to increase far more materially than has characterized the past week. Chicago has never seen coal business so poor, and never wants to see it again in such a condition. We hear of a foundry or factory starting up here and there, but such renewals have not increased the tonnage of this market as yet. The spring trade is looked forward to with the hope that it will furnish a decided improvement, and create a sufficient demand to break the unusual dullness.

The reduction in the price of anthracite coal by Eastern companies does not concern the West. So far as Chicago is concerned, the scale remains unchanged. Freight rates on coal from the coal fields of Ohio to Lake Erie ports will not be changed. This was decided on at a meeting here of the Ohio Coal Traffic Association.

**Anthracite.**—Prices are: Egg, range and chestnut, \$6.10. Retail prices are quoted nominally at \$7.25 per ton. This price, however, is openly shaded, and coal is sold at \$7.

**Bituminous.**—Some increase in bituminous coal is noted over previous week, but this is slight. Without doubt, the miners in the vicinity of Brazil will have to stand a decrease in their wages. No strike will occur should the decrease be made, as the miners agree that at the lower rates steadier employment will be had. Some 2,000 miners in the Hocking Valley coal fields have agreed to resume work again after being out on strike. The coal companies will pay the price for machine mining asked by the miners. Quotations are per ton of 2,000 lbs. f. o. b. Chicago: Youghiogheny, \$3.35; Pittsburgh, \$3.35; Hocking Valley, \$3.10; Brazil block, \$2.70; Raymond, \$3.75; Shawnee, \$3.10; Cumberland smiting, \$3.70; Mt. Olivet, \$2. Cannel coal quotations are: Pinkney, \$4.25; Birdseye, \$5.60; Kentucky, \$5.60.

**Coke.**—Coke drags along with no apparent improvement. Prices remain the same, which are: Connellsville furnace, \$4.20; crushed, \$4.30; Ellsworth, \$3.75@4.25; West Virginia, \$3.75@4.

Pittsburg. Feb. 22.

(From our Special Correspondent.)

**Coal.**—We have to report a dull and unsatisfactory market; operators and miners are a consider-

able distance apart in their views. The Ohio River being in good navigable shape, the shipments during the past four days reached 4,358,000 bushels, being principally in boats. It was consigned to markets along the lower Mississippi. Coal at the lower Ohio markets was disposed of at starvation prices. All but one of the Panhandle coal mines have accepted the Ohio scale, which was previously presented by the operators; this means the employment of nearly 1,000 men at once. The Ohio miners' ultimatum is: For pick mining, screened, per ton, 50 cents; run of mine coal per ton, 35 5-7 cents; room turning, \$2.50; track layers, per day, \$1.75; trappers, 75 cents; drivers, \$1.75; dumpers and trimmers, \$1.50; outside day labor not less than \$1.25; firemen, \$1.50; pumpers, \$30 per month.

**Connellsville Coke.**—The output of the region shows a liberal gain in production, which ran up to 86,427 tons; increase, 7,175 tons. Demand continues to increase. The operators are well pleased with both the situation and outlook, and are confident that the Connellsville region will within the next 60 days have regained all the trade lost. Connellsville coke at the price now quoted is expected to drive all other cokes out of the market. The wage question is unchanged; the companies making late changes in rates of wages refuse to make their scales public, which makes the actual situation a go-as-you-please affair. The men are well pleased to see the coke trade dropping away from Virginia and returning to the Connellsville region. The region has now 9,505 ovens in blast, the largest list of burning ovens since last July; the active list during the week will exceed 10,000. Prices nominally unchanged. The week's shipments show up well; the new ovens will, no doubt, show an increase the coming week.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 23, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '93		From Jan., '94.	
	Feb. 24, 1893.	Feb. 23, 1894.	Tons.	F'ces.	Tons.	F'ces.
Anthracite.	74	32,668	27	13,944	257,249	112,672
Coke.....	139	130,593	83	85,467	1,039,729	671,336
Charcoal...	37	9,050	18	3,852	71,925	30,994
Totals...	250	172,311	128	103,223	1,369,503	814,812

**Pig Iron.**—This market continues in the same condition that we reported it to be in a week ago. The consumption of pig iron is doubtless increasing hereabouts, but it is doing so at a rate which precludes all possibility of a sudden sharp advance. Sellers also are still too eager to market their product, and although we hear of Southern furnaces, which have continued to make low prices, we do not think that values are any weaker than they have been of late. Quotations are nominally as follows: Northern brands: No. 1, \$13@14; No. 2, \$12.50; gray forge, \$12. For Southern iron we quote: No. 1, \$13@13.75; No. 2 F., \$12@12.50; No. 1 soft F., \$12@13; gray forge, \$11@12—all at tide-water. Scotch irons are quoted: Coltness, \$21.50@22; Eglinton, \$19.50@20; Summerlee, \$21.50@22.

**Billets and Rods.**—We do not hear of any sales of billets or rods this week. We quote nominally: Domestic billets, \$18@18.50; wire rods, domestic, \$26@27.50; foreign rods, \$39@40.

**Manufactured Iron and Steel.**—No new business is reported in manufactured iron and steel this week. Prices show no improvement and are still low. We quote Angles, 1'40@1'60c.; axles, scrap, 1'50@1'70c. delivered; steel, 1'0@1'70c.; bars, common, 1'25@1'30c.; refined, 1'45@2c. on dock; beams, up to 15 in., 1'50@1'60c.; 20 in., 1'70@1'90c.; car truck channels, 1'95@2c.; channels, 1'50@1'65c. on dock; steel hoops, 1'55@1'75c., delivered; links and pins, 1'55@1'75c.; plates, flange, 1'80@2c.; firebox, 2@2'50c.; flange, 1'75@2c.; marine, 2'50@2'75c.; sheared, 1'80c.; shell, 1'50@1'70c.; tank, 1'35@1'50c.; universal mill, 1'40@1'60c.; tees, 1'79@2c., all on dock.

**Merchant Steel.**—There is no change to report of this market. It continues quiet. Quotations are: Tool steel, \$6@6.50; tire steel, \$1.90@2; toe calk, \$2@2.20; Bessemer machinery, \$2@2.10; open hearth machinery, \$2.10@2.20; open hearth carriage spring, \$2@2.10; crucible spring, \$2@2.10.

**Old Material.**—No business of importance is reported in old material. Quotations are nominally as follows: Old steel rails, street, at \$9.75 f. o. b. cars Jersey City; old iron tees, \$12.50 per ton New York; railroad scrap, \$12 per ton delivered at mill, and yard scrap at \$10 vessel New York; old iron T rails, standard sections, at \$11.75@12.00, New York delivery; wrought turnings, delivered at mill, \$9; railroad scrap, also delivered at mill, \$12; No. 1 wrought scrap at \$9.50@10, and No. 1 machinery cast scrap, \$9.50@10.50, delivered to vessels at this port; old steel rails, \$9@10; old wrought tubes and pipe, \$7.50@8.50; wrought turnings at \$8.50@9 delivered at mill; old car wheel, \$10.50@11 New York; cast borings, \$5.50@6 delivered at mill.

**Rail Fastenings.**—No business is doing in rail fastenings. Quotations are nominally: Fish and angle plates, 1'30@1'50c. at mill; spikes, 1'75@1'90c.; bolts and square nuts, 2'15@2'40c.; hexagonal nuts, 2'30@2'50c.; delivered.

**Spiegeleisen and Ferromanganese.**—No sales are reported in this market of either ferro or spiegel.



Prices are nominally: Spiegeleisen, 10@12%, \$21@ \$22; 20%, \$25@26. Ferromanganese, \$52@53.  
**Steel Rails.**—No business of any importance is reported in steel rails. The market continues very quiet. The combination price for standard sections, \$24.80 tidewater, still obtains. Girder rails are quoted at \$28 at mill.

NOTES OF THE WEEK.

A dispatch from Cleveland, O., states that E. C. Pope & Co., agents for the Norrie iron mine, in the Gogebic range, have sold to the Shenango Valley Steel Company, of Newcastle, Pa., a block of ore said to be between 50,000 and 60,000 tons, at \$2.75 per ton, which is nearly \$1 below the rate at which similar ore sold a year ago.

Buffalo. Feb. 22.

(Special Report of Rogers, Brown & Co.)

We think that there is more activity this week, but coupled with lower prices. It is difficult to say just where the market is. As a matter of fact history is being made every day, and great activity is required to keep from being old fashioned. We quote for cash, f. o. b. cars Buffalo: No. 1 X foundry strong coke iron, Lake Superior ore, \$12.75; No. 2 X foundry strong coke iron, Lake Superior ore, \$12.25; Ohio strong softener No. 1, \$12.75; Ohio strong softener No. 2, \$12.25; Jackson County silvery No. 1, \$15.80@17.30; Lake Superior charcoal, \$14.75; Tennessee charcoal, \$15.50; Southern soft No. 1, \$12.50; Alabama car wheel, \$16.50@17.50; Hanging Rock charcoal, \$18.50@20.

Chicago. Feb. 21.

(From our Special Correspondent)

One more week has been added to the long-continued depression, and the outlook is not very encouraging. Inquiries appear to be more numerous, but the same general unwillingness to buy ahead still prevails. The consumers one and all appear to have settled down to the view that no material change in market prices is likely to occur for some time; and again, that the uncertainty regarding future business conditions leads them to refuse to buy excepting in small lots and for use as they need it. The Corning Steel Company is making preparations to open its works at Hammond, Ind. It is hoped that within a couple of weeks the mill will be running with full force. The plant has been idle nearly a year. The company will confine itself exclusively to the manufacture of sheet steel. The reported sale of 90,000 tons of iron ore by the Norrie mine to a Pennsylvania furnace company at \$2.75 per ton has created considerable surprise in the Chicago iron trade. The price is nearly \$1 below last year's quotations. The Illinois Steel Company claim that they have not bought any iron ore for the coming season, and do not know when they shall. The employees of the East Chicago Iron and Steel Company having refused to accept a reduction of 13%, the company have closed down the works temporarily.

**Pig Iron.**—Inquiries are coming in to a somewhat larger extent, but they fail to bring business of any importance. Small lots constitute the sales, with a larger sale here and there. Consumers buy chiefly for immediate use, and then in quantities for use as they actually need it. There is no change in the position of the furnace companies north or south. Prices are per gross ton f. o. b. Chicago: Southern coke, foundry, No. 1, \$12.50; No. 2, \$11.65; No. 3, \$11.15; Southern coke, foundry, soft, No. 1, \$11.65; No. 2, \$11.15. Local coke, No. 1, \$12.25@12.50; No. 2, \$11.75@12.00; No. 3, \$11.50@11.75. Local Scotch, No. 1, \$12.50@12.75; No. 2, \$12.25@12.50. Southern silveries, No. 1, \$12.50@12.75; No. 2, \$12@12.25. Bessemer, \$13. Southern car wheel, \$18@18.25. Ohio strong softeners, \$14.50@15. Tennessee charcoal No. 1, \$15@15.50.

**Structural Iron and Steel.**—Nothing of importance has developed in local business during the week, and there is absolutely nothing in sight. Quotations are as follows, Chicago delivery: Angles, 1.55@1.60c.; tees, 1.80@1.90c.; universal plates, 1.55@1.65c.; sheared plates, 1.80@1.90c.; beams and channels, 1.45@1.55c.

**Plates.**—Demand is fairly good, with good prospect of continuing so. Prices are, mill shipments, Chicago delivery: Flange steel, 2.00@2.10c.; best fire-box steel, 3.00@5.00c.; tank steel, 1.90@1.70c. Store prices are: Iron or steel sheets 10 to 14, 2.00@2.15c.; tank steel, 1.90@2.00, flange steel, 2.25@2.50c.; sheet steel, 2.25@2.50c.

**Merchant Steel.**—Sales are somewhat larger than last week, while inquiries have increased. Dealers regard the situation as being bright for a further increase of business. Prices are, carload lots: Smooth finished machinery steel, 1.90@2.00c.; tire steel, 1.90@2.10c.; ordinary Bessemer bars, 1.50@1.55@1.65c.; toe calks, 2.25@2.35; ordinary tool steel, 6.50@7.00c.; special brand tool steel, 12@20c.; crucible spring, 3.50@3.75c.

**Galvanized Sheet Iron.**—Some increased activity is observed. Quotations on Juniata are 70, 10 and 5% off for mill shipments. Jobbing quotations are selling at 75% discount.

**Black Sheet Iron.**—One small feature distinguishes the past week over its predecessors. It is that large jobbers are beginning to feel the market on good round blocks for future delivery, some extending into the fall. These inquiries are chiefly in the line of feelers. The indications are that there is going to be a greater volume of sales the next month than any two previous months since May

last. Some weakness is reported in prices, but this has not been entirely substantiated. Mill prices carload lots f. o. b. Chicago, No. 24, 2.40c.; No. 26, 2.50c.; No. 27, 2.60c. Same gauges and steel sheets are 3.10c.@3.20c., less 10c. per 100 lbs. for large lots.

**Bar Iron.**—Inquiry keeps up and a good many small orders are materializing. The probabilities are that this condition of things will hold for some little time to come, but it cannot be said that any large blocks have presented themselves, but as the season advances new lines of business will come into the market requiring iron, and a better volume of trade will undoubtedly show itself. For small lots from stock, prices are 1.60@1.70c. for iron and 1.65@1.75c. for soft steel bars. Mill prices f. o. b. Chicago, 1.30@1.35c. for bar iron, and 1.40c. for soft steel bars.

**Billets.**—The market for billets is rather inclined toward improvement, though nothing to show any great or continued improvement is noted, the tonnage for the week being slightly more than the previous one. Quotations on billets are \$18.50, Joliet, rods are \$25.

**Nails.**—Wire nails have improved considerably, there being quite a large volume of business in carload lots and up. Most of the trade is with the West. Steel cut nails are not in much demand. Prices per keg, \$1.25@1.30. The Lakeside nail mill at Hammond, Ind., started up this week with a full force of rollers. Nearly 250 skilled workmen will be employed in the cutting department.

**Scrap.**—There is no improvement whatever in scrap iron. A sale of good size is reported here and there, with prices not told, but which can well be judged are much lower than the market quotations, which are: Railroad, \$10.75; No. 1 forge, \$8.50@9; cast borings, \$4.50; wrought turnings, \$6.50; axle turnings, \$3; leaf steel, \$14; mixed steel, \$7; tires, \$13.00; iron axles, \$14.00@14.50.

**Old Rails and Wheels.**—Condition remains as usual, with no signs of change. Dealers' prices are yet far beyond those that the consumer offers. Quotations now in vogue are \$11.50@12.50 for old iron rails and for old car wheels, \$9.50@10.50 is quoted.

Philadelphia. Feb. 22.

(From our Special Correspondent.)

**Pig Iron.**—Offers made last week by buyers for considerable lots of forge iron were withdrawn this week without explanation. As to foundry irons, buyers who promised to place large orders this week have not done so yet. Many foundries are nearly out of iron, and are getting new business, but up to to-day refuse to make large purchases. One explanation is that outside foundry irons have been quietly offered at \$13 for very fine quality No. 1. There are abundant offerings of mill irons at \$11.

**Steel Billets.**—Persons in a position to know attach but little importance as yet to the possibilities of cheaper billets from cheaper ore. Large buyers will not pay \$18 at this time and do not believe they will have to pay that much at any time, as they learn more producing capacity is soon to be set to work.

**Merchant Iron.**—A general shading has been made by manufacturers to secure business, but the effect this week has been to scare buyers off. Country millowners have named extremely low prices within three days. Prices run from 1.20@1.40.

**Nails.**—Tidewater quotations, \$1.10. The action of makers in adding to stocks has a bad effect on buyers.

**Pipes and Tubes.**—Very little business this week, but more talked of.

**Sheet Iron.**—The only sign this week of increasing business is the placing of good-sized orders for galvanized iron. The store demand is small. Orders at mill are light, but the inquiries rather encourage makers in the belief that a better day is near.

**Skelp.**—One big order, or rather inquiry, has been sighted on the horizon, and every concern will be after it. The usual quotation is 1.35.

**Plate and Tank.**—Tank and flange steel orders have been picked up this week to allow work to be proceeded with. The plate mills are not crowded, but agents are pleased with the amount of work in sight. The delay in placing it is not due to prices, as plate has been sold at 1.25 and less.

**Structural Material.**—Ship and bridge building requirements came to light on Monday, but the amounts wanted are small. The mills are in urgent need of work. Angles are offered at 1.50; beams, tees and channels at 1.60. The usual brilliant hopes are expressed, but bald facts are not encouraging. Competition is very close.

**Steel Rails.**—Railroad companies do not feel encouraged to spend money even where repairs are urgent, and as for new roadbed they will wait. Quotations, \$24; girders, \$28.

**Old Rails.**—Iron are quoted at \$11.

**Scrap.**—No. 1 is quoted at \$11.

Pittsburg. Feb. 22.

(From our Special Correspondent.)

**Raw Iron and Steel.**—The inquiry for the various forms of iron and steel continues to increase in volume steadily, and the improved tone of the trade is accepted as beyond question. But the change is by no means radical in its nature, and the competition for the business offering is still so sharp that there has been but little improvement in prices, except in certain kinds of standard or favorite brands.

The market is certainly assuming a more satisfactory condition. There is also an improved inquiry for foundry iron. As a rule, however, buyers continue to exhibit cautiousness in anticipating their future requirements, relying on the competition among the various furnaces and mills to keep prices from taking any sudden movement upward. Production of pig iron shows no tendency to increase, and stocks of unsold iron at the furnaces are said to be of moderate proportions and fluctuate from month to month to very narrow limits.

At the foundries the supply for some time has been unusually small, so that the expansion on the buying movement is likely to have a beneficial effect on prices, which continue low and unsatisfactory, notwithstanding that the cost of production has been correspondingly reduced by cheaper ores and fuel. The largest inquiry was for soft steel, which is rapidly taking the place of iron; in fact steel is cheaper and better adapted for almost any use. Let us compare prices: Skelp iron is selling, wide and narrow grooved, \$1.25 per 100 lbs., 4 months; skelp steel, wide grooved, \$1.05 per 100 lbs., 4 months; the difference in the cost alone would be a large profit. These facts show beyond question that the time for puddling iron is fast drawing to a close.

**Finished Iron and Steel.**—The improvement continues; business steadily growing, a favorable feature being that stocks in first and second hands have been materially reduced. Steel rails are dull with no demand; prices nominal, \$24 f. o. b., at works.

Coke Smelted Lake and Native Ore.		April, at mill.....	
Tons.	Cash.	500 Billets, prompt, at mill.....	16.00
2,500 Bessemer, March, April.....	\$10.75	200 Billets, Feb., at mill.....	16.0
2,000 Bessemer, March, April.....	10.70	<b>Muck Bar.</b>	
2,000 Bessemer, Feb., March.....	10.75	250 Neutral, Feb., March.....	20.25
1,500 Bessemer, Feb., March.....	10.70	200 Neutral.....	20.00
1,000 Bessemer, Feb., March, April.....	10.75	100 Neutral.....	20.00
1,000 Bessemer, March, April.....	10.60	100 Neutral.....	20.25
1,000 Bessemer, prompt 10.75		<b>Skelp Iron.</b>	
1,000 Gray Forge, Feb., March.....	9.75	450 Sheared.....	1.45 4 m.
500 No. 3 Foundry, Feb., March.....	10.25	410 Wide gr'v'ed.....	1.25 4 m.
500 Gray Forge, Feb., March.....	9.75	380 Nar. gr'v'ed.....	1.25 4 m.
500 Gray Forge, March.....	9.75	<b>Ferro-Manganese.</b>	
500 No. 1 Foundry.....	12.00	200 80% delivered.....	52.00
200 No. 2 Foundry.....	11.00	<b>Sheet Bars.</b>	
50 No. 1 Foundry all ore.....	12.50	250 At maker's mill.....	21.80
50 No. 2 Silvery.....	13.00	<b>Blooms, Billets, Bar Ends.</b>	
<b>Charcoal.</b>		500 Delivered.....	10.75
50 Cold Blast.....	25.50	200 Beam ends.....	10.00
50 Warm Blast.....	17.00	<b>Steel Wire Rods.</b>	
50 Cold Blast.....	24.50	500 5 gauge American at mill.....	25.00
50 No. 2 Foundry.....	17.00	<b>Spelter.</b>	
<b>Blooms, Billets and Slabs.</b>		200 Prime Western, Feb., March.....	3.75
2,500 Billets and Slabs, Feb. to May, at mill.....	16.25	<b>Skelp Steel.</b>	
1,500 Billets, March, April, at mill.....	16.15	500 Wide gauge.....	1.05 4 m.
1,000 Billets, March, April, at mill.....	16.00	<b>Scrap Material.</b>	
1,000 Billets, March, April, at mill.....	16.15	300 No. 1 Wrought, net.....	10.00
1,000 Billets, March.....		200 Cast scrap, gross.....	9.0
		100 Iron axles, net.....	15.00
		100 Light steel scrap, gross.....	8.75
		25 Heavy steel scrap, gross.....	10.00

METAL MARKET.

NEW YORK, Friday Evening, Feb. 23, 1894.  
 Prices of Silver per ounce Troy.

Feb.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	Feb.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
17	4.87	29½	63¾	.492	21	4.87½	29½	62¾	.464
19	4.87	29½	63¾	.490	22	4.87½	29½	62¾	.462
23	4.87½	29	62¾	.486	23	4.87½	27½	59¾	.462

Silver has declined rapidly the past few days, more rapidly than circumstances seem to warrant. Fear of an Indian import duty—not prohibitory, but for revenue—hangs like a pall over the market, and buyers are prevented from purchasing. The free sales of Council bills are also used to carry down the price of silver. The future is all uncertain, but we are approaching a figure when a considerable decrease in production may be expected.

The United States Assay Office at New York reports the total receipts of silver for the week to be 126,000 oz.

**Gold and Silver Exports and Imports at New York, Week Ending February 17th, 1894, and for Years from January 1st, 1894, 1893, 1892.**

Week	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
1894...	\$27,900	\$97,093	\$1,878,087	\$75,593	\$1,193,301
1894...	2,692,658	1,639,018	6,933,851	194,587	7,192,904
1893...	20,816,567	133,757	3,913,252	477,975	24,117,987
1892...	2,563,922	2,018,755	3,810,539	248,415	4,107,291

The gold exported for the week went to the West Indies, the silver to Europe. The gold imported was from France and the West Indies, the silver from South America.



During the five days ending February 23d, the exports and imports of gold and silver have been as follows: Exports, gold, \$31,400; silver, \$427,491. Imports, gold, \$264,520; silver, \$3,926. Of the gold exported, \$12,000 was in American coin, \$10,000 of which went to Central America and \$2,000 to South America. The remaining \$19,400 was Spanish coin, and went to the West Indies. Of the silver exported \$13,500 was in Mexican coin, and \$413,991 in American coin, and all went to London.

NOTES OF THE WEEK.

The general business situation continues to improve, slowly perhaps, but steadily, and there are encouraging signs everywhere of greater activity and of increased progress towards normal conditions.

Rumors continue as to probable changes in the new tariff bill, but they do not seem to be more worthy of credit than those to which we have referred from time to time. The only point of importance that can be noted is that the bill as passed by the House is still in committee, and it is uncertain when it will be submitted to the Senate.

The statement of the New York banks for the week ending February 17th shows decreases of \$11,096,875 in reserve; \$9,212,700 in specie; \$2,930,200 in legal tenders, \$4,184,100 in deposits, \$447,300 in circulation; and an increase of \$6,743,300 in loans. The reserve was \$74,536,825 in excess of legal requirements.

The surplus reserve is now lower than it has been for any week since the opening of the year; it is \$9,259,825 below that of the first week in January, and \$37,086,175 lower than the highest point reached this year, on February 3d.

The changes shown last week are all in the direction of greater business activity, and may be taken as signs of improvement in trade. The increase in loans, though not so large as in the previous week, is still considerable and this feature promises to continue.

The statement of the United States Treasury on Wednesday, February 21st (the 22d being a holiday) showed balances in excess of outstanding certificates amounting to \$133,124,058, made up as follows: Gold, \$105,877,298; silver, \$8,857,737; legal tenders, \$7,262,286; treasury notes, etc., \$11,186,737. During the week there was a decrease of \$367,806 in the total balance, and an increase of \$491,907 in gold.

Attorney-General Olney on February 20th sent to the Secretary of the Treasury an opinion in regard to the legal status of silver certificates, in which he says: Silver certificates are just what they purport to be on their face and by their terms—that is, they attest the fact that the United States has on deposit so many silver dollars which will be paid to the holder upon the presentation and surrender of such certificates. If they can be regarded as money at all, it is only because the United States agrees to receive them "for customs, taxes and all public dues," and only to that extent and for those specific purposes. In my opinion, they are not "lawful money" within the meaning of Section 4 of the act of June 20th, 1874, and Section 9 of the act of July 12th, 1882.

This means, of course, that the silver certificates can only be exchanged at the Treasury for silver dollars, and that the holders cannot require payment in legal tenders or gold. The ruling must be regarded by the Treasury Department unless set aside by a decision of the courts.

The Bland bill for the issue of certificates for the seigniorage on the silver in the Treasury is still in the House, its opponents having so far succeeded in delaying all action. At present there seems to be little probability of its passage, and if it should pass the House, or houses, it would be vetoed by the President, so it is not a "live question."

The deposits of domestic gold bullion at the mints and assay offices of the United States during the year 1892 aggregate \$32,367,850, and the deposits for calendar year 1893, \$36,056,300, showing a gain in the deposits of gold of domestic production in 1893 over that of 1892 of \$3,688,450. The largest increase shown in any State was in Colorado; the only State showing a decrease in gold deposits last year was Nevada.

The present rate of exchange and the demand for money in Germany have led to predictions that gold will again be exported from this country, as the conditions would make the operation profitable. So far, however, there have been no exports to Europe and there are no signs that any will be made at present.

No gold was engaged February 23d for export, although if shipment were profitable at current exchange quotations, the specie would have been ordered that afternoon for Saturday's steamers. But not only has the 1 to 2 cents per pound premium on gold been obviously withdrawn, but there are not a few indications of a glut of gold in the great European institutions. Both the Bank of England and the Bank of France reported February 22d the

largest gold reserves on their respective records; both are in consequence retiring circulating notes, the English bank having redeemed \$1,000,000 last week, and the French bank no less than \$8,600,000. Both have become free lenders of money, and the Bank of England has reduced its official rate a second time. Nevertheless, if sterling rates advance ½ cent further it will be profitable to ship gold.

The Bank of England on Thursday, February 22d, reported a total of £29,759,768 gold on hand, an increase of £787,075 during the week ending on that day.

The statement of the Bank of France on Thursday, February 22d, shows an increase during the week of £144,000 gold and £128,000 silver, making its specie holdings £29,171,418 in gold and £51,714,349 in silver.

Silver and Indian exchange have continued to go lower, and in London on February 21st the India Council sold 50 lakhs of rupees at 13½d. per rupee, with a small amount at 13¼d. The fall in Council bills, since the effort to maintain a fixed price was abandoned, has thus been 1½d. On the same day the price quoted for silver was 28¼d. @ 28½d. per ounce.

The situation in India continues critical. The disturbance of the usual courses of trade was last week referred to, and this week's advices say that there is almost a panic in the commercial centers. Bank rates of discount have been advanced to 9% in Calcutta and Bombay, and there is everywhere a scarcity of money, private terms being much above the bank rate.

The course of the India Council in refusing, until very lately, to sell drafts below a fixed rate and in borrowing money in London to meet its obligations, has had the effect of locking up a large amount of money in the Indian treasury, and has thus materially aided in the financial disturbance.

The Currency Commission, appointed by the German Government, held in Berlin, February 22d, Count Posadowsky, Secretary of the Imperial Treasury, presided. In his speech introducing the proceedings he said that, owing to the recent action of India and the United States in currency matters, and the continued depreciation of silver, the subjects to come before the commission were of the greatest importance to the commerce and trade of Germany and the world at large. The questions to be considered demanded earnest and exhaustive examination. The commission's task would be to ascertain whether or not the value of silver could be raised; if it could be raised, what were the best means to the end; how the silver price could be kept stable; and what was the best basis for practical measures that would tend to solve the problem of an efficient agreement of States.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$48	\$51
Peruvian soles and Chilean pesos....	46	49
Victoria sovereigns.....	4.87	4.89
Twenty francs.....	3.88	3.92
Twenty marks.....	4.71	4.78
Spanish 25 pesetas.....	4.83	4.88

Other Metals.

**Copper.**—The aspect of the market has been rather different this week as there has been considerable buoyancy abroad, where, on reported heavy buying by smelters, prices for G.M.B.'s rapidly advanced, reaching the top on Tuesday afternoon when the ruling prices were £41 17s. 6d. for spot and £42 7s. 6d. for three months prompt. Then came a reaction, and prices receded as rapidly as they had advanced, and close at £40 17s. 6d. for spot and £41 7s. 6d. for three months prompt. The little buying movement which set in with the advance in the speculative market ceased immediately the activity in G.M.B.'s came to an end, and we have to quote refined and manufactured as below: English tough, £43 @ £43 2s. 6d.; best selected, £43 15s. @ £44; strong sheets, £70 10s. @ £51; India sheets, £49 @ £49 5s., yellow metal, 4¼d.

Really, the only effect of this advance upon the American markets was to make still firmer the already too strong views of some producers, causing them either to entirely withdraw from the market or restrict their sales, as consumers did not respond in the least to the upward movement expressed in the higher prices asked. In fact, they were able to buy small second hand lots of lake copper at 9½ New York. Casting we have to quote as 9 to 9½. The reports coming to hand from manufacturers are more encouraging, as they advise that the working hours are being increased, but the purchases made of raw material still leave considerable to be desired.

The Quincy Mining Company has issued a notice of a meeting, to be held March 15th, for the purpose of taking action relative to doubling the share capital.

The exports of copper from the port of New York for the week ending February 23d, as reported by the New York Metal Exchange, were as follows:

Hamburg-Taormina.....	Ingots	179	tons
"	Bars	20	"
Antwerp-Rhynland.....	Ingots	50	"
"	Plates	20	"
Rotterdam-Rotterdam.....	Ingots	200	"
"	Bars	65	"
"	Pigs	89	"
Rotterdam-Loch Etive.....	Bars	25	"
London-England.....	Ingots	50	"
Swansea-Chicago City.....	Pigs	22	"
Havre-La Champagne.....	Ingots	35	"
"	Plates	25	"
"	Bars	12	"

The exports of copper from Baltimore for the week ending February 21st, as reported by our special correspondents, were as follows:

Feb. 14.. Rotterdam-Urbino.....	13,264 ingots	195,600	Lbs.
"	120 cakes	67,543	"
"	2,121 plates	44,800	"
Feb. 16.. London-Massapequa.....	7,071 ingots	112,000	"
Feb. 17.. Liverpool-Rossmore.....	239 cakes	57,212	"
"	234 bars	22,487	"
Feb. 19.. Hamburg-Stubbenbuk....	11,766 ingots	181,800	"
"	479 cakes	125,579	"
"	541 bars	89,812	"
"	2,410 ingots	112,214	"
"	5,459 plates	112,000	"

Tin has been affected by the great decline in silver values, and the price has been lowered day by day, the lowest notch being reached this morning, when the London quotation was £65 10s. Since then the market has become firmer, and business has been done at £66.

Such prices as these are of course attracting attention from consumers, and of late deliveries here have been very large. In addition, fair-sized orders have been sent to London and the East, and it is not at all unlikely that events will prove that bottom has been reached; we certainly believe it has, for the present, unless silver should collapse completely, which it is not to be expected it will.

We quote 19@19½c., with only a few sellers at the lower figure, and then in not less than car load lots.

Lead is dull with more pressure to sell. What little business has been done has been at 3 25 to 3 20, one sale having been made at 3 10. There is evidently an accumulation of supplies in the west, but as soon as it is disposed of a rather firmer market may be expected as the low price of silver should favorably affect that of lead.

In England prices are rather firmer and higher, as Spanish lead is now to be quoted £9 6s. 3d. @ £9 7s. 6d., and English at 2s. 6d. higher.

The exports of lead from the port of New York during the week ending February 22d, as reported by the New York Metal Exchange, were as follows:

Antwerp-Westernland.....	100	tons
Glasgow-Greician.....	100	"
Liverpool-Bovic.....	25	"
Antwerp-Westernland.....	150	"
Havre-Hankow.....	75	"
Leith-Croft.....	100	"
Bordeaux-Panama.....	100	"

Spelter continues to rule very strong, as there is good buying, and the prices given in our last week's issue are fully maintained. We quote spot and March delivery at 3 925 @ 3 95 New York, with hardly any sellers of future deliveries.

The London market is lower, with good ordinaries quoted at £15 15s., and specials at £15 17s. 6d.

Antimony is steady, Cookson's at 10c., L. X. at 9½, and Hallett's at about 9c.

Quicksilver.—Quotations remain at \$32.50 for New York and \$5 17s. 6d. for London.

**Aluminum.**—The Pittsburg Reduction Company quotes No. 1, over 98% pure, 65c. per lb. for large lots, 75c. for small quantities; No. 2, from 94% to 96% pure, 60c. for large quantities, 73 for small lots. Wire from \$1.25 to \$2.58 per lb., according to size. Plates and sheets, 90c. @ \$1.50, according to width and thickness. The Neuhausen Company quotes \$1 per kilo. (45c. per lb.) at the works at Neuhausen, in Switzerland.

**Magnesium.**—The Aluminum und Magnesium Fabrik, Hemelingen, Germany, quotes prices as follows: Ingots and cubes, \$6.48 per kilogram; bars, \$6.24; powder, \$8.64; ribbon and wire, \$9 12 per kilo. These prices are at the works and for orders of over 10 kilos; for less than 10 kilos, 24c. per kilo. must be added for ingots and bars, and 48c. for powder or wire.

**Platinum.**—Messrs. Eimer & Amend, New York, quote platinum crucibles and dishes, hammered ware, French make, at 45c. per gram for smaller quantities, 43c. per gram for lots of not less than 100 grams, and 41c. for lots of not less than 250 grams. Wire and foil at 42c., 41c. and 40c. respectively for the quantities named. Current retail price for crucibles is 50c. per gram. At present platinum prices are steady.

**Sodium.**—Prices, as quoted by the manufacturers in Germany and England, are 90c. @ \$1 per lb.

**Nickel.**—Quotations are 45 @ 55c. per lb., according to grade.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Feb. 23.

**Heavy Chemicals.**—No change worthy of mention has taken place in the heavy chemical market since our last report. It continues dull and quiet. For caustic soda there is some jobbing demand. Alkali and carbonated soda ash are quiet. Bleaching powder has been in better inquiry. Prices show no change of importance. We quote as follows: Caustic soda, 60%, 2 77½ @ 2 82½c.; 70%, 2 60 @ 2 70c.



74%, 2'62 1/2 @ 2'82 1/2 c.; 76%, 2'85 @ 2'90 c. Carbonated soda ash, 48%, 1'10 @ 1'25 c.; 58%, 1'05 @ 1'15 c. Alkali, 48%, 1'05 @ 1'15 c.; 58%, 1'01 @ 1'10 c.; according to package. Sal soda, English, '95 @ 1c; American, '80 @ '90 c. Bleaching powder, 2'12 1/2 @ 2'50 c.

**Acids.**—The acid market here continues very quiet. Only a small jobbing demand is reported. We quote: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, \$1.62 1/2 @ \$1.75; muriatic, 18", 80c. @ \$1; 20", 90c. @ \$1.10; 22", \$1 @ \$1.25; nitric, 40", \$40; 42", \$45 @ 4.75; sulphuric, 75c. @ \$1. Mixed acids according to mixture, oxalic, \$6.30 @ \$7. Blue vitriol is quoted all the way from \$3.37 1/2 to \$3.75; glycerine for nitro-glycerine, 11 1/2 @ 12 1/2 c., according to quality and quantity.

**Brimstone.**—There is nothing new to report of the market for Sicilian brimstone. It continues quiet. Quotations for best unmixed seconds are: On the spot, \$18; shipments, \$17.25 @ \$17.50. Thirds are \$1 less.

**Fertilizing Chemicals.**—Prices still rule high for ammoniates, but the market for fertilizers continues very quiet and featureless. We quote: Sulphate of ammonia, gas liquor, \$3.85 @ \$3.90; bone, \$3.65; dried blood, \$2.60 @ \$2.65 per unit for high grade and \$2.40 @ \$2.45 for low grade. Azotine, \$2.50 @ \$2.60. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P<sub>2</sub>O<sub>5</sub>, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P<sub>2</sub>O<sub>5</sub>, 92 1/2 c. per unit. Acidulated fish scrap, \$15 @ \$16, and dried scrap nominally \$25 f. o. b. fish factory; wet scrap, \$15 f. o. b. fish factory. Tankage, high grade, \$25.50 @ \$26.50; low grade, \$22 @ \$22.50. Bone tankage, \$23 @ \$24; bone meal, \$24 @ \$25.50.

In lots of 50 tons on contracts we quote: Double manure salts, 48-53% (basis 48%); New York and Boston, \$1.12; Philadelphia, \$1.14 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.17. High grade manure salts, 90-95% and 96-99% (basis 90%), respectively: New York and Boston, \$2.07 @ \$2.11; Philadelphia, \$2.09 1/2 @ \$2.13 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$2.12 @ \$2.16.

**Phosphates.**—Quotations are as follows: Land rock, 60% bone phosphate of lime, \$5 f. o. b. vessel Charleston; 62%, \$5.75; river rock, 58%, \$6; all kiln-dried.

**Muriate of Potash.**—In lots of 50 tons, prices are as follows for muriate of potash: 80-85% and minimum 95% (basis 80%), respectively: New York and Boston, \$1.78 @ \$1.91; Philadelphia, \$1.80 1/2 @ \$1.83 1/2; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$1.83 1/2 @ \$1.86.

**Kainit.**—Prices for kainit (minimum, 23%) in cargo lots for 1894 delivery contracted prior to January 31st are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, \$9 @ \$9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, \$9.75 @ \$10. For sylvinit, 27-35%, prices are as follows per cent. per gross ton, invoice weights: New York, Boston and Philadelphia, 37 1/2 c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weights, 1c. more per cent.

**Nitrate of Soda.**—There is no change to report of nitrate. Quotations are: \$1.90 @ \$1.95 on the spot.

**MINING STOCKS.**

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 190 and 192.]

**NEW YORK, Friday Evening, Feb. 23.**

Washington's Birthday is responsible for the small volume of business in mining stocks at the Consolidated Stock and Petroleum Exchange. When a holiday comes on Thursday the aggregate sales are naturally smaller. At the beginning of the week there was more inquiry for mining shares, but prices in San Francisco commenced to drop and the Comstocks declined accordingly.

The Comstocks opened well, and it seemed as though we were going to be treated to another "boomlet." The attempt proved abortive, as usual. Consolidated California & Virginia advanced from \$4.25 to \$4.50, then declined to \$3.75; at these prices 500 shares changed hands. The closing bid price to-day was \$3.10. Sales of Comstock Tunnel aggregated 3,700 shares at 7c. @ 9c. Other sales were: 200 shares of Alta at 17c.; 200 shares of Best & Belcher at \$2.20; 100 shares of Chollar at 65c.; 500 shares of Consolidated Imperial at 24c.; 100 shares of Exchequer at 30c.; 200 shares of Mexican at \$1.85; 100 shares of Crown Point at 85c.; 200 shares of Gould & Curry at 80c.; 200 shares of Ophir at \$2.90 @ \$3.15; 200 shares of Sierra Nevada at \$1.10 @ \$1.25; and 300 shares of Yellow Jacket at \$1 @ \$1.15.

For the first time in months Eureka Consolidated shows transactions this week; 200 shares were sold at 20c.

Of the California stocks, the most active was Quicksilver. Of the common stock 1,220 shares at \$2.50 @ \$2.88 were sold and 300 shares of preferred at \$16 @ \$17. Bodie Consolidated shows a solitary transaction of 100 shares at 25c. There was a sale of 100 shares of Standard Consolidated at \$1.

The Standard Consolidated Mining Company has declared dividend No. 88 of 10c. per share, payable at the company's office in San Francisco, Cal., and in this city on March 15th. Transfer books close March 5th.

The only Colorado stock traded during the week

was Leadville Consolidated, of which 300 shares at \$1 @ 12c.

Sales of Ontario amounted to 250 shares at \$7.88 @ \$8.

**NOTES OF THE WEEK.**

A terrific explosion occurred February 22d in the coal mines at Blossburg, three miles southwest of Raton, N. M., and soon a band of miners were set at work to investigate the amount of damage, and if possible, give succor to those within. Up to a late hour six bodies had been recovered, and it is believed that two Italians who are missing are in the mine and are probably dead. Three men were badly hurt. The explosion was probably caused by the ignition of gas in an entry by a miner's light. It is reported that Joseph Fotheringill, the fire inspector, but a few minutes before the explosion had notified William Graham, the pit boss, that his entry, which is 1 1/2 miles from the opening of the mine, was dangerous on account of being filled with gas. Had the explosion occurred on a regular work-day it is believed that more than 100 men would have perished. The Blossburg coal mines have been operated for the last 13 years by the Atchison, Topeka & Santa Fé Company, and are the largest in the territory.

Fire was discovered February 23d in the main shaft of the Springfield Junction coal mine, at Springfield, Ill., which will likely destroy the entire plant, entailing a loss of \$100,000. It is thought the men are not all out of the mine, and fears are held for their safety. Much excitement prevails. The mine is owned by Harris Hickox, and is one of the largest in central Illinois.

Some late mining notes from British Columbia are given below:

The ore shipped from the Slocan, Ainsworth and Nelson, during the six weeks ending February 15th amounted to 1,824 tons. The Washington was the largest shipper, with 240 tons; the Mountain Chief came second, with 205 tons.

Slocan District.—Work on the Northern Belle has opened up a 7-ft. vein of gold, which averages 100 oz. silver and 80% Pb.

A contract has been let to haul 500 tons of ore to Silverton from the Alpha mine (Grady group). Some 60 ft. of surface stripping on this claim has shown up a vein averaging 11 ft. across.

Ainsworth District.—The reported find of gold on the Wakefield claim has been confirmed, it is said. That gold should exist in such quantities in this camp is remarkable. The owners are the Canadian Pacific Mining Company.

Nelson District.—Some 25 men have been laid off from the Silver King. The cause of this is that the company will not work more ore at present, and their ore houses are full. Work is continued on the Kootenay Bonanza. Boring with the diamond drill lower down the hill will be carried on to prospect and test the late find on the Kootenay Bonanza.

Trail Creek District.—Le Roi has 300 tons waiting shipments.

A shipment of a carload has been made from the O. I. C., on Sheep Creek.

Boundary Creek District.—A rich find has been made on the St. Lawrence claim. This claim was abandoned, but by a little chance work some high-grade ore was discovered. Some 600 lbs. of this ore was taken out, all of which shows free gold, but contains galena, grey copper, zinc, arsenic and antimony ore. The owners have brought down the 600 lbs. to Spokane to be sampled by Messrs. C. M. Fassett & Co., of Spokane, before shipping to the Tacoma smelter.

In the Skylark mine a contract for 120 ft. of shaft and drift has been let. Work will be commenced at once.

Some late Ontario notes are as follows:

Gold Hill.—The main shaft is now down 50 ft. and the ore is said to improve with depth.

Sultana Gold Mine.—The new shaft and hoist are completed and ore is being raised.

Y-One Mining Company.—At the annual meeting at Cleveland, O., recently, the following board of directors were elected: Henry L. Phillips, William B. Page, Lauchlin McSecord, H. S. Sprague, O. P. Lewis. Later the board of directors elected the following officers: Henry L. Phillips, president; William B. Page, vice-president, charged also pro tem. with the duties of treasurer; Oscar P. Lewis, secretary, charged also pro tem. with the duties of general managers. A committee appointed by the stockholders of the company held an investigation into the affairs of the company and found that the property is worth over \$250,000 for the purposes of readjustment of stock interest and development, which is situated on Silver Creek, about 25 miles from Port Arthur. On this property considerable development and exploration work has been done, part of which consists in a tunnel 155 ft. long, driven in from Silver Creek toward the main silver-bearing ledge.

**Boston.** Feb. 22.

(From our Special Correspondent.)

There has been more activity in copper stocks the past week at improved prices. The firmness of ingot copper abroad early in the week had a tendency to stimulate buying for the speculative ac-

count, and as there were no large lots of stock offering, prices responded easily to the upward turn, but in the later dealings much of the improvement was lost, although the market closed generally about one per cent. higher than last week. There was a fair demand for Calumet & Hecla, which opened at \$297, sold at \$296, with final sales at \$295. Tamarack declined to \$157 1/2, advanced to \$159, and closed at \$158. Dealings in both of the above stocks were quite small. Quincy was in good demand and advanced from \$120 to \$122. There was good buying of Osceola this week, which carried the price up from \$24 1/2 to \$26 1/2, losing only 3/4 in final dealings. It is good opinion in copper circles that the Osceola can easily earn \$2 per share the coming year, and possibly \$3, and that the stock at present prices is a fair investment.

Franklin sold at \$9 1/2, advanced to \$9 3/4 and closed at \$9 1/2. Atlantic declined to \$9 for 150 shares, recovered to \$9 1/2 @ \$9 3/4 for small lots.

For the first time this month there was some trading in Centennial at a decline from \$4 to \$3 1/2. Later it advanced to \$3 3/4, which was the closing price.

A small lot of Kearsarge sold at \$6, a decline of 3/4 from last sale. Wolverine sold at \$1 1/2 @ \$1 3/4 for small lots.

There was considerable trading in the Montana stocks. Boston & Montana advanced from \$23 1/2 to \$26, with later sales at \$25.

Butte & Boston advanced from \$8 to \$9 1/4, losing only the fraction in the final sales.

The dealings in the above two stocks aggregated over 3,700 shares this week, as compared with 300 last week.

Total sales this week 6,236 shares; last week, 1,090 shares.

To-day being a holiday there was no session of the board.

**San Francisco.**

SAN FRANCISCO, Feb. 23 (By Telegraph).—The opening quotations to day are as follows: Best & Belcher, \$1.80; Chollar, 60c.; Consolidated California & Virginia, \$3.10; Eureka Consolidated, 10c.; Gould & Curry, 75c.; Hale & Norcross, 60c.; Mexican, \$1.25; Mono, 10c.; Navajo, 10c.; Ophir, \$2.20; Savage, 65c.; Sierra Nevada, \$1.15; Union Consolidated, 90c.; Yellow Jacket, 85c.

**London.** Feb. 14.

A correspondent of the Indian "Engineer" says that there is a good deal of talk going on about the Wunthoo goldfields, and that Dr. King's report is awaited with much anxiety. The statement that the first report is, on the whole, satisfactory, will therefore add considerably to the excitement. Government will not grant any concessions until Dr. King's final report is received, but it is said that a powerful syndicate has been formed which is prepared to go to work as soon as permission is granted; so it is possible we may yet see an outbreak of "gold fever" in Burma.

**DIVIDENDS.**

Carpenter Steel Company, dividend of one and half per cent., payable at the company's office in New York, March 1st, to stockholders of record on February 20th.

Homestake Mining Company, dividend No. 187, of fifteen cents per share, \$18,750, payable February 26th at the office of Messrs. Lounsbury & Co., Mills Building, No. 15 Broad street, New York City.

National Lead Company, dividend of one and three quarters (1 3/4) per cent. on the preferred stock, payable March 15th at the office of the company, No. 1 Broadway.

Standard Consolidated Mining Company, dividend No. 83 of 10 cents per share, \$10,000, payable March 15th at the office of the company in San Francisco, Cal., and at the Farmers' Loan and Trust Company in New York. Transfer books close March 3d.

**MEETINGS.**

Addie C. Mining Company, at the office of the company, room 204, Mining Exchange Building, Denver, Colo., February 26th, at 3 p. m.

Colorado Coal and Iron Development Company at the office of the company in Pueblo, Colo., April 2d, at 12 o'clock noon.

Copper Head Mining Company, at the office of the company, room 508, California Building, Denver, Colo., March 14th, at 2 p. m.

Delhi Mining Company, at the office of the company, room 11, No. 14 Sansome street, San Francisco, Cal., March 14, at 10 a. m.

Lehigh Coal and Navigation Company, at the office of the company in Philadelphia, Pa., February 27th, at 12 o'clock noon.

Princess Gold Mining Company, at the office of Messrs. Reed Bros., No. 28 South Tejon street, Colorado Springs, Colo., February 28th, at 2 p. m.

Red Cloud Gold and Silver Mining Company, at the office of the company in Denver, Colo., February 25th, at 10 a. m.

Robinson Consolidated Mining Company, at the office of the company in New York City, March 6th, at 11 a. m.

Sterling Iron and Railway Company, at the office of the company, No. 51 Wall street, New York, March 6th, at 12 o'clock noon.

NEW YORK MINING STOCK QUOTATIONS.

Table with columns for NAME AND LOCATION OF COMPANY, DIVIDEND-PAYING MINES (Feb. 17-23), SALES, and NON-DIVIDEND-PAYING MINES (Feb. 17-23), SALES. Includes companies like Bicher, Nevada; Belle Isle, Nevada; and Alpha, Nevada.

\*Ex-dividend. †Dealt in at New York Stock Ex. ‡Unlisted securities. §Assessment paid. ¶Assessment unpaid. D dividend shares sold, 3,970. Non-dividend shares sold, 5,000. Total shares sold, 8,970.

BOSTON MINING STOCK QUOTATIONS.

Table with columns for NAME OF COMPANY, Feb. 16-22, SALES, and NAME OF COMPANY, Feb. 16-22, SALES. Includes companies like Atlantic, Michigan; Breese, Colorado; and Alcoa, Michigan.

Dividend shares sold, 3,695. Non-dividend shares sold, 2,690. Total shares sold, 6,385.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid—Acetic, chem. pure... 17¢ @ 19. Commercial, in bbls. and cbsys... 01 1/2 @ 02. Carbonic, liquefied... 18¢ @ 25.

Cadmium Iodide—lb... \$5.50. Chalk—ton... \$1.50 @ \$2.25. China Clay—English, ton... \$13 @ \$18.00. Chlorine Water—ton... 10 @ 25. Chrome Yellow—ton... 10 @ 25.

Mineral Wool—Ordinary slag... 01 1/4. Ordinary rock... 02 1/4. Ground, ton... 04 @ 06. Naphtha—Black... \$10.00. Nitre Cake—ton... \$10.00.

Tin—Crystals, in kegs or bbls... 14 @ 15. Muriate, single... 07 @ 12. Double or strong, 54° B... 10 @ 16.

THE RARER METALS.

The prices given below are the prices in Germany, and are per gramme except where otherwise stated: Arsenic (metallic), per kilo... \$0.25. Barium (metallic), per kilo... 2.12.



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table listing dividend-paying mines with columns for Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total Levied, Date and amount of last), and Dividends (Total paid, Date and amount of last).

Table listing non-dividend-paying mines with columns for Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total Levied, Date and amount of last), and Dividends (Total paid, Date and amount of last).

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

COAL AND COAL RAILROAD STOCKS.

Table with columns for COMPANY, Feb. 17, Feb. 19, Feb. 20, Jan. 21, Feb. 22, Feb. 23, and Sales. Lists various coal and railroad stocks with their respective prices and sales figures.

Total shares sold, 29,633.

INDUSTRIAL AND TRUST STOCKS.

Table with columns for NAME OF STOCKS, Feb. 17, Feb. 19, Feb. 20, Feb. 21, Feb. 22, Feb. 23, and SALES. Lists industrial and trust stocks with their prices and sales.

Total shares sold, 247,644.

CALIFORNIA.

San Francisco.

Table titled 'CLOSING QUOTATIONS' for San Francisco, listing various stocks and their prices from Feb. 16 to Feb. 22.

COLORADO.

Table for Colorado stocks, listing companies like Argonaut, Aspen, and others with their prices as of Feb. 20.

Colorado Springs, Feb. 17.

Prices and sales for the week ending February 17th, 1894.

Table for Colorado Springs, Feb. 17, listing prices and sales for various stocks like Cripple Creek, Anaconda, and others.

Prices and sales for four days ending February 15th.

Table for Colorado Springs, Feb. 15, listing prices and sales for various stocks like Alamo, Anaconda, and others.

MARYLAND.

Baltimore.

Table for Maryland Baltimore stocks, listing companies like Balt. & N. C., Conard Hill, and others with bid and asked prices.

MINNESOTA.

Duluth.

Table for Minnesota Duluth stocks, listing companies like Biwabik M. Iron Co., Great Northern Min. Co., and others.

UNLISTED STOCKS.

Table for unlisted stocks, listing companies like Adams Iron Co., Ashland Iron Co., and others.

London Quotations.

Table for London Quotations, listing various international stocks and their prices as of Feb. 6, 1894.

Paris.

Table for Paris Quotations, listing various European stocks and their prices as of Feb. 2.

New York Mining Stocks.

(Latest quotations.) Feb. 23.

Table for New York Mining Stocks, listing various mining companies and their prices as of Feb. 23.

ASSESSMENTS.

Table for Assessments, listing companies, their assessment amounts, and due dates.

PENNSYLVANIA.

(Specially Reported by S. K. Davis.) Stock quotations week ending Feb. 17.

Table for Pennsylvania stocks, listing companies like Bald Butte, Benton Group, and others.

PHILADELPHIA.

Table for Philadelphia stocks, listing companies like Bloomington C. & C., Buck Mountain, and others.

PITTSBURG.

Table for Pittsburgh stocks, listing companies like Bridgewater Gas, Chartiers Valley Gas, and others.

MISSOURI.

Table for Missouri stocks, listing companies like Adams, American & Nettie, and others.



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Frue Vanner Concentrator.  
Gates Iron Works.  
Hendrie & Bolthoff Mfg. Co.  
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(See Machinery.)

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Central Mining Co.  
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Boas, Clarence M.  
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Carpenter, Franklin R.  
Case, Wm. H.  
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Chandler, W. H.  
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Dickinson, H. P.  
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**STEAM HEATING, ETC.—Office** Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 7th day of March, 1894, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure, return circulation, steam heating and ventilating apparatus required for the U. S. Post Office, etc., building at San Jose, Cal., in accordance with the drawings and specification, copies of which may be had at this office, or the office of the Superintendent at San Jose, Cal. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Low Pressure, Return Circulation, Steam Heating and Ventilating Apparatus for the U. S. Post Office, etc., Building at San Jose, Cal.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

**U. S. ENGINEER OFFICE, 537 Congress Street,** Portland, Me.—Sealed proposals for removal of ledge in Western approach to channel through Moosabec Bar, Maine, will be received at this office until March 5th, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. PETER C. HAINS, Lieut. Colonel of Engineers.

**WATER-WORKS.—Sealed bids** will be received by the Mayor and City Council of the city of Kenosha, Wis., until March 19th, 1894, for the construction of a system of water-works. Plans and specifications are now on file at the office of the City Clerk in the city of Kenosha; also at the office of W. S. Reed & Co., Engineers, 517 The Rookery, Chicago, Ill. The system embodies 13 miles of cast iron mains, 130 hydrants, 5,000 ft. of 20-in. intake pipe for lake, stand-pipe 20 ft. x 110 ft., two 2,000,000-gallon pumps, two 66-in. x 16 ft. boilers, and brick pump house. Each bid shall be accompanied with a certified check for \$2,500, made payable to the city of Kenosha. Bids on the work as a whole only received.

**WATER-WORKS.—Office of the City Clerk,** city of Buffalo, Wyo.—The city of Buffalo, Wyo., invites proposals for the construction of its proposed Gravity System of Water-Works in accordance with the plans and specifications on file in the office of the undersigned. Sealed proposals will be received by the undersigned up to March 31st, 1894. For instructions as to manner and form of submitting bids, terms and conditions of payment, and all other necessary information, call on or address WM. H. FENN, City Clerk, Buffalo, Wyo.

**DREDGING.—U. S. Engineer Office, 121 Franklin** street, Buffalo, N. Y.—Sealed proposals for dredging in Dunkirk Harbor, N. Y., will be received at this office until March 7th, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. Major E. H. RUFFNER, Corps of Engineers.

**PUMPING ENGINES.—SEALED PROPOSALS** will be received by the Winnipeg Water-Works Company at Winnipeg, at their office in the said city, until March 10th, 1894, for the construction and erection complete, in readiness for operation, upon a suitable foundation to be provided by the water company in a building to be erected for the purpose at the present pumping station of the water-works, of a vertical fly-wheel pumping engine capable of safely, regularly and economically forcing 2,000,000 gallons of water per day from the level of Assiniboine River against a pressure of sixty (60) pounds, with a suction lift of not over twenty (20) feet. Specifications may be obtained on application to the company, at Winnipeg, Manitoba. E. H. BISSETT, Manager.

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**WATER-WORKS.—SEALED PROPOSALS** will be received by the city of Greenfield, Ind., until March 21st, 1894, for furnishing the materials and constructing a system of water-works for said city. There will be required about 452 tons of cast iron pipe, 13 tons of special castings, 60 fire hydrants, brick pumping station and chimney, two pumps of combined capacity of 2,000,000 gallons per day, pump well, the necessary valves, valve boxes, etc. Bids will be received for furnishing materials above or for constructing the works complete. Plans may be seen and specifications and blank form of proposal procured at the office of the City Clerk, Greenfield, Ind., or at the office of the Engineers, Voorhees & Witmer, rooms 65 and 66 Chapin Block, Buffalo N. Y. AMBROSE J. HERRON, Mayor. HARRY G. STRICKLAND, Clerk.

**U. S. ENGINEER OFFICE, WILMINGTON** N. C.—Sealed proposals for dredging in the Inland Waterway between Beaufort Harbor and New River, North Carolina, will be received at this office until March 10th, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. W. S. STANTON, Major Corps of Engineers, U. S. A.

**IRON VAULT DOORS.—TREASURY** Department, Office of the Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 20th day of March, 1894, and opened immediately thereafter, for all the labor and materials required to supply and put in place the iron vault doors for the U. S. Court House and Post Office at Troy, N. Y., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent at Troy, N. Y. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. of the amount of the proposal. The right is reserved to reject any and all bids and to waive any defect or informality in any bid if it be deemed in the interest of the Government to do so. All bids received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Iron Vault Doors for the U. S. Court House and Post Office, Troy, N. Y.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

**DRILLING ARTESIAN WELLS.—DEPARTMENT** of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals indorsed "Proposals for Drilling Artesian Wells," and addressed to the Commissioner of Indian Affairs, Washington, D. C., will be received until April 10, 1894, for furnishing the necessary materials and labor required in drilling one artesian well each on the Pine Ridge, Rosebud and Standing Rock Indian Reservations in South Dakota. Bidders to furnish their own specifications for doing the work, and if possible state the length of time proposed to be consumed in drilling each of the wells. A separate bid for each well is required. Location of the proposed wells, means of transportation, with cost per cwt., and such knowledge of the local conditions of each reservation as is had by the U. S. Indian Agents in charge of the reservations named, will be furnished upon application to said agents, whose postoffice addresses are respectively: Pine Ridge Agency, S. D.; Rosebud Agency, S. D., and Standing Rock Agency, N. D. Proposals will be made to do the work at stated rates per foot, and not for a lump sum. The right is reserved to reject any or all bids or any part of any bid if deemed for the best interests of the service. D. H. BROWNING, Commissioner.

**U. S. ENGINEER OFFICE, WILMINGTON, N. C.**—Sealed proposals for dredging at Shad Island Bend, Roanoke River, N. C., will be received at this office until March 10th, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. W. S. STANTON, Major Corps of Engineers, U. S. A.

**FUEL, ETC.—Office of Light House Inspector,** Eighth District, at New Orleans, La.—Proposals will be received at this office until April 4th, 1894, for furnishing and delivering fuel and provisions for vessels and stations in this district for the fiscal year ending June 30th, 1895. Forms of proposal and printed specifications, giving full particulars as to the kinds of fuel required, the quantity and quality, and the terms of delivery and payment, can be obtained at this office. J. B. COUGHLAN, Commander U. S. N., Light House Inspector.

**FUEL AND PROVISIONS—Office of Light** House Inspector, Sixth District, Charleston, S. C.—Proposals will be received at this office until the 31st day of March, 1894, for furnishing, 1, fuel for tender and light vessels for the fiscal year ending June 30th, 1895, and 2, provisions for tender and light vessels for the fiscal year ending June 30th, 1895. Forms of proposal and specifications showing what is required can be had or seen by applying to this office. Applicants for forms and specifications should state whether it is for fuel or provisions that they wish to bid. H. R. S. MACKENZIE, Lieutenant Commander U. S. Navy, Light House Inspector.

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