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Pig Iron Production.

While the production of pig iron in the United States has fallen considerably below the high level which it reached in the closing months of 1895, it is still at the rate of over 10,000,000 tons per year. The tendency is still rather downward, but less so in March than it was in January, and we hear of few furnaces going out of blast at the present time, though there are fewer still starting up. As was the case nearly all of last year, the variations in output have been chiefly in Bessemer pig, and the production of foundry irons has been fairly steady, with a prospect that it will continue so.

A close estimate of the output for the first quarter of the year is as follows:

Fuel.	1895.	1896.	Increase.	P. C.
Anthracite.....	291,202	453,383	162,781	35.8
Coke.....	1,928,924	2,197,364	268,410	13.3
Charcoal.....	61,094	67,520	6,426	9.5
Total.....	2,281,220	2,718,867	437,647	19.1

The furnaces a year ago had begun to feel an increase in demand from the extreme depression of the previous year and had reached a point which they maintained but hardly increased until the effect of the "boom" was felt in July. There seems hardly any reason to expect a similar boom this year; but on the other hand very little cause to anticipate a reduction in the present activity.

British Guiana.

The recent acute diplomatic stage of the dispute between Venezuela and Great Britain, with the possible intervention of the United States, has had a very detrimental effect upon the gold mining industry in British Guiana. The very rumor and possibility of the abandonment by Great Britain of the recently developed districts in Upper Guiana, which have been developed by both American and British capital, have sufficed to paralyze the work now going on. Orders for machinery in this country, contemplated and already being negotiated for, are suspended, and work upon paying properties is also at a standstill. This we have learned from private parties, and from our Georgetown, Demerara, exchanges. Work has been closed down on the properties of the Winter Syndicate, the Bartley Syndicate and the Barima Development Company.

The Barima district is the most important and productive of those yet developed, and there was every prospect that a large addition would have been made to the stamping capacity of the mills, the orders for which would undoubtedly come to this country, although the territory is British. The reason given by the proprietors is that they do not consider in the present unsettled state of the boundary question, that their rights are sufficiently secured to justify them in incurring the heavy expenditure which the continued prosecution of the work and erection of plant would require. Their natural apprehension is that if their property were transferred from British territory to Venezuelan, there would be considerable danger of its being taken from them without any compensation.

The Metric System.

Referring once more to the subject which has frequently been dealt with editorially in the *Engineering and Mining Journal*, and one that we are aware is of very great interest to the majority of our readers, many of whom are as constant advocates of the adoption of the system as ourselves, we publish in another column the text of the bill reported favorably by Mr. Charles W. Stone in the House of Representatives, Washington, from the Committee on Coinage, Weights and Measures. The period proposed before which the compulsory adoption of the metric system shall take effect is ample, viz., to the first day of July, 1898, for all the departments of the Government of the United States, with the exception of the Land Office, which will be enabled to complete current surveys under the existing measurement. The compulsory clause of the bill for the public generally, constituting the metric system of weights and measures as the only legal one recognized in the United States, gives more than ample time in our opinion for a gradual change, the date being fixed as January 1st, 1901.

We draw special attention to the matter at this time at the request of the American Meteorological Society, whose headquarters are in Columbia University, New York, which society is circulating a petition to obtain signatures in favor of the measure, and any one interested in the subject can obtain a blank form of petition upon application to the secretary, Mr. J. K. Rees. Such petitions should be forwarded to some member of Congress in Washington, advising the society at the same time of having done so. We earnestly recommend all readers of the *Engineering and Mining Journal* to lend their support to this step forward in the progress of civilization.

The Steel Combination.

The meetings which have been held recently, including that of the present week in New York, at which all the prominent steel-makers in the United States were represented, may be taken as resulting in an

great advantage to the smelting industry. I may mention that there is, throughout the country, an ample supply of fir, spruce and pine timber for charcoal.

VANCOUVER, B. C.

Anglo-American Club of Freiberg.

Sir: It may interest very many of your readers who have passed through the course at Freiberg in former years to learn that there is little variation in the system of instruction. No changes of have occurred during the last few years in either the "Lehr-plan" or the staff of professors and instructors. Bergrath Stelzner's successor is Dr. Beck, formerly of the Saxon Geological Survey, Leipzig, Germany. Dr. Beck is still a young man and has the reputation of being a good geologist, but, of course, no one can ever be found who would fill the place as did Herr Stelzner.

Dr. Bergat, who was Stelzner's assistant (now at Würzburg as "Docent") has all of Stelzner's manuscripts, I believe, and intends to bring out the book on "Ore Deposits" which Stelzner had in preparation. Stelzner had the book almost completed, the result of his indefatigable work, but never being thoroughly satisfied with his labors kept continually at his work and for this reason he never quite finished it himself.

I had the pleasure of hearing Professor Stelzner's lectures on Geology, Paleontology, and part of the one on Ore Deposits, and it was a great pleasure to listen to him as he evinced such a thorough interest himself in everything he lectured upon, and could talk for hours without growing weary. His associations with his students were very pleasant, always ready and willing to help them, and the very life of his excursions; one man in a thousand.

Professor Treptow has the chair of "Mining" and "Concentration." His lectures are very interesting, and especially those on concentration are very instructive. Dr. Kallbeck is the assistant in the metallurgical laboratory, and has the practical work in blowpipe and assaying; ostensibly these belong to Professor Richter, but Dr. Kallbeck in reality runs them. He also delivers the lectures on assaying, and is very popular.

Dr. Papperitz is professor of mathematics, but mathematics are too dry to interest many of your readers to say much about. Professor Uhlich has civil engineering and mine surveying. The courses are fair, and especially the mining part is quite thorough; of the other professors little need be said. Richter, Winkler, Weissbach and Ledebur are so well known. Erherdt has been for 26 years in charge of the physics department and elektrotechnik, and Undeutsch for a number of years has had "Mechanics." Roch has "Drawing," "Architecture" and furnaces.

The club will keep an eye open for anything new in mining or metallurgy, and will inform you of anything new that turns up. The Germans are so conservative that there is little that is new to be seen around any of the works, and even when they discover anything new and useful they apparently hate to use it, in addition to which miners and smelters are especially conservative and even superstitious.

I wish to thank you personally for your kindness in sending the *Mineral Industry*, but I know you take a great interest in the work that is done. We have a very fair library, and it is a source of great help to the boys, especially such books as the *Mineral Industry*, Peters' *Copper Smelting* and the other publications of the Scientific Publishing Company. They are always in request and used by the members.

ALBERT DOERR.
ANGLO-AMERICAN CLUB, Freiberg, Ger., Feb. 28, 1896.

"Gold Mining in the South."

Sir: The sweeping denouncement of Southern gold mines, written by Mr. C. F. Z. Caracristi, C. E., and published in your issue of March 28th, wherein he says "they are all worthless and will waste the money of all investors in them," calls for a protest, as it is calculated to mislead those who might wish to invest their money in a fair field and with every chance for success.

The Southern States have given \$46,000,000 in gold to the world, as mint returns will show; nine-tenths of which was washed from streams and placers, the veins being still almost virgin ground, only needing enterprise and capital to develop them into paying properties.

With the new processes of gold extraction, easy access to the mining districts, and cheap railroad freights on machinery and supplies, there is a great future for gold mining in the South. For some further information on this subject, I would like to call Mr. Caracristi's attention to a very interesting publication issued in 1895 by the U. S. Geological Survey, entitled "The Gold Fields of the Southern Appalachians," by Mr. George F. Becker.

R. PARKER CRENSHAW, M. E.
WASHINGTON, D. C., March 31st, 1896.

Sir: I notice in your issue of March 28th, a sweeping assertion by a Mr. Caracristi, as to the worthlessness of the gold mines of the Southern States, and as to his belief that some "boom" is a fraudulent myth. I merely desire to ask Mr. Caracristi to inform me, either through your columns or by private letter, to what "boom" he refers, and I will aid him by investigating it and exposing it if he is correct. I would also invite that gentleman to visit me, either in Atlanta or in Heflin, Ala., and I will take great pleasure in accompanying him to some gold mines in the Southern States, which I know I can demonstrate to the satisfaction of any reasonable man, possess value equal, if not greater, than ore bodies of the same grade and extent, in other mining camps. While the Southern States do not possess a large number of valuable gold mines, yet they do contain some, and within their boundaries there are also a large number of very promising prospects of refractory ore bodies. So far as his statement regarding "free gold samples" is concerned, if he knows anything at all about the South, he ought to know that we do claim that it is the absence of free milling ore which has been the most important factor in hindering the development of the gold mines of the Southern States.

Mr. Caracristi has done the South an injustice in his correspondence, and ought to be man enough to apologize for it.

I am the last man to attempt to foster or aid any fraudulent scheme, but I do like to see justice done to all sections, and under all circumstances, and that is something your correspondent has entirely ignored.

819 EQUITABLE BUILDING, ATLANTA, GA.

WILLIAM M. BREWER.

Gold Mining in the South.

Sir: As a free-born American citizen, with a strain of Dutch blood in my veins (which, however, does not interfere with the beating of an honest heart, or a plainly expressed word of congratulation to anyone who has come from South America), and, quiet by nature, as becomes one of the unfortunate race of mining engineers, I was astonished on perusing your issue of March 28, wherein a correspondent generally denounces the gold fields of the Southern States.

The writer has, without doubt, made a close study of the regions he so unqualifiedly condemns, and perhaps has been one of the few engineers who have been charged with important interests on the belt, and has seen the cash of his principals slowly dissolve in the sluiceways of ill-advised and expensively worked plants which are monumental evidences of blundering on the part of someone.

There are throughout the South a number of most stupid attempts to win gold from low-grade ores, and it needs only a casual survey of the territory which has been called gold-bearing, and a glimpse of some of the mechanical devices, which have been brought into the country to coax the gold out of stockholders pockets, to satisfy any observing engineer of this day and generation that there never was a possibility of winning gold at a profit by such means. But it shocks me rudely to have a general and sweeping denunciation of an entire mineral belt come upon us from South America just at a time when we have been congratulating ourselves that the errors and omissions of the past were over, and that from henceforth there was a chance, if no more, for developments and workings of a character so common and so successful in other countries, which are not unlike the Southern States in ore characteristics. Surely your correspondent must have seen over the entire mineral belt of the South some evidences of gold, and in quantities which would pay for proper operations on the scale to be seen at the Haile mine, and he surely will be fair in stating that operations like the Haile are possible wherever like conditions exist? He must know that out of the millions of acres which comprise the mineral belt from the Potomac River to Alabama, there has scarcely been scratched an area worth mentioning, and that no observing traveler has ever yet seen the first example of large and practical development of territory except in the neighborhood of Dalonega, Ga., which compares with the workings in the western mineral states. He must know, if he is conversant with the facts, that in all the Southern belt there cannot be named 10 properties which have been opened with sufficient development fund to insure a success, taking into account all the disadvantages to be overcome at the time. He ought to know that millions of tons of low-grade ores exist within easy reach of prospectors, and that so far in the development of the greater number of mines from end to end of the belt, only those ores which yielded by the crude means employed over \$10 per ton in free gold were at all profitable. While it is true that from end to end of the belt there is associated with the free gold ores a definite percentage of sulphurets, which will assay from \$5 to \$350 per ton, yet it is also true that not one example can be given where these sulphurets were utilized, until within the past few years, and only at three or four mines during that time. These few examples have been successes, and the contention among engineers to-day is that the chlorination process will bring success to a great many gold properties which are identical with the Haile, and are to be found at intervals from the Northern end of the belt to the Alabama line.

I wonder if your South American correspondent has ever heard it stated that Cripple Creek has over 11,000 recorded claims, and only 200 of them actually producing in paying amounts, *i. e.*, raising gold in excess of their expenditures? A great many other celebrated mining districts might be cited in the same manner to show the discrepancy between the promises and fulfillments of mining, but it remains a fact which is unquestioned at this date, that there have been no practical and sufficient developments along the mineral belt of the southern states which will warrant a broad statement such as your correspondent makes, condemnatory of an entire line of gold-bearing rocks, which have produced millions of dollars by crudest means, and which offer every inducement for practical operations by methods now universally successful. I will be pleased to show the gentleman at any time such properties as will qualify his remarks, and perhaps make him an enthusiastic admirer of low-grade propositions which are plentiful in the state of Virginia, limiting myself to this scope by reason of duties which forbid my prospecting in other fields to the southward.

MINERAL CITY, VA., March 31st, 1896.

W. H. ADAMS.

ABSTRACTS OF OFFICIAL REPORTS.

The Mysore Gold Mining Company.

The bar gold produced during the year amounted to 69,487 ounces, and the gross amount realized by the sale of the same was £270,911 0s. 8d.

It is interesting to note that, compared with 1894, there is an increase of 17,214 oz. of the value of £87,823 14s. 6d.

This total gives a net result of £141,455 for the year of which balance £118,246 was distributed to the shareholders in dividends and a liberal sum, about £20,000, carried to reserve fund and written off as depreciation of plant.

The quartz crushed amounted to 60,654 tons, which produced 58,855 oz. of gold; 38,597 tons of tailings were treated by amalgamation, producing 7,180 oz.; and 18,065 tons of tailings were treated by the cyanide process, producing 3,452 oz. Six thousand ounces additional gold were obtained to December 31st last from the quartz crushed, but not included in the returns, being a portion of the 7,000 oz. referred to in the circular issued to the shareholders on the 12th ulto., and 43 oz. having been recovered since the end of December from the different slags collected from the cyanide works during last year, and therefore properly belonging to the year's production.

The sum of £22,425 5s. 5d. was spent on Capital Account during the year; £13,154 8s. 10d. of this amount represented the additions to machinery, plant and buildings, thereby increasing the inventory to that extent, and the balance of £9,270 10s. 7d. was laid out upon unproductive work, mainly in connection with sinking Ribblesdale's shaft.

The sinking fund has been increased to £65,000 by the addition thereto of £15,000 out of the year's profit.

Reserves on December 31st last were estimated at 96,613 tons, or no less than 20,063 tons more than at the end of 1894.

TOTAL RETURNS FROM THE COMMENCEMENT TO DATE.

Tons of quartz crushed.	Tons of tailings treated.	Oz. bar gold from quartz and tailings.	Oz. standard gold.	Amount realized.
376,112	257,788	480,823	482,616·017	£1,877,739 18 7
Dividends paid to date, £900,094.				

The Nundydroog Company, Limited.

The product for the year amounted to 38,923 oz. of bar gold, including a stock of 300 oz. in hand at the mines on December 31st last.

The amount realized by the sale of gold was £144,079 14s. 10d., this, together with the receipts from transfer fees, rents, interest, etc., made the income on revenue account £145,219 1s. 3d.

The profit for the year was £77,139 of which £54,960 was distributed in dividends.

A statement of the gold returns is appended, showing that 32,975 tons of quartz were crushed, yielding 37,393 oz. of gold, and that, 7,775 tons of tailings were treated, yielding 1,530 oz., making the total production for the year 38,923 oz. of bar gold. These figures compare with 29,750 tons of quartz crushed in 1894, yielding 28,200 oz. of gold; and 7,625 tons of tailings treated, producing 1,457 oz. of gold; total 29,657 oz. It will therefore be seen there was an increase of 9,266 oz.

The average yield per ton of quartz crushed was 1 oz. 2 dwts. 16 grs. as compared with 18 dwts. 23 grs. during 1894, which shows the satisfactory increase of 3 dwts. 17 grs. per ton in the grade of the ore milled. There was no material difference in the quality of the tailings.

The total costs in India and England amounted to £1 16s. 11d. per ton of quartz milled, as against £2 0s. 2d. in the previous year, a difference of 3s. 3d. per ton. Exclusive of the amount expended on the treatment of tailings, the costs were £1 15s. 3d. per ton of quartz.

A new battery of 30 heads of stamps, with engine and boilers capable of operating 40 heads, has been supplied. These stamps will probably be completed ready for work by the end of the present month, making ultimately 70 heads in all.

Total returns from the commencement to date:

Tons of quartz crushed.	Tons of tailings treated.	Ounce bar gold from quartz and tailings.	Ounces standard gold.	Amount realized.
137,083	20,847	181,547	174,040	£878,594
Dividends paid to date, £254,374.				

ELECTRICITY IN MINING OPERATIONS.

Written for the Engineering and Mining Journal by Wm. Baxter, Jr.

The extent to which electricity is applied to mining operations is very much greater than it is supposed to be by those who have not had occasion to familiarize themselves with the subject. Men not directly engaged in this line of work are, as a rule, aware of the fact that a great deal has been said as to the possibilities of electricity in this field, but they, no doubt, believe that these possibilities have only been demonstrated practically in a few isolated experimental plants.

This may be true in regard to the mining industry as a whole, but there is one department in which the application of electricity has passed far beyond the experimental stage, and it is forging ahead with such rapid strides as to justify the belief that before many years pass by it will be in undisputed possession of the ground, without a rival of any importance, except in localities where the natural conditions are such as to render its use impossible. This field is in coal mining, and it is doubtful if there is a district of any importance where at least one electric installation is not in operation.

Wherever an electric coal cutting machine has been introduced, it has been soon followed by several others, not only in the same mine, but in other mines in the same locality. The reason for this is not difficult to find, as for this line of work electricity is pre-eminently well adapted, and the economy of these machines is greater than that of those operated by compressed air, with which it has to compete.

Not only is electricity crowding compressed air out of the field in the operation of coal cutting machinery, but it is also making a place for itself in the department of mine haulage. The electric motor is fast emancipating the mine mule underground just as it has emancipated the street car horse upon the surface. The saving in the cost of hauling by the use of electric locomotives is very considerable even in the cases that are most favorable for the employment of animal power, but in mines where the coal only runs three or four feet thick the gain assumes decidedly important proportions owing to the fact that it is not necessary to cut away unproductive material to obtain the head room required where mules are used.

Although accurate statistics showing the extent to which electricity is used in the coal mining industry would prove a revelation to the great majority of men not familiar with the facts, the reason for this extensive use can be easily discovered. In the first place, coal mining is the largest branch of the mining industry, at least so far as it concerns the use of power and machinery; second, the character of work done is favorable for the use of machinery to advantage. It may also be added that the problem of devising machines for working coal successfully had been worked out previous to the advent of electricity in the field, and therefore it simply became a question of substituting one form of power for another, and as soon as it was demonstrated by the actual performance of a few machines placed in regular service, that electrically operated coal cutters would do the work at less cost, their success became an established fact.

The only cases in the coal mining industry where electricity will not be able to obtain a foothold will be in mines that are so gassy as to render its use dangerous, but even in some of these places it may become possible to use it by introducing a sufficiently effective system of ventilation. This expedient would not seem impracticable, at least in some of the milder cases, as a part of the saving effected in the operations of

mining could be expended in enlarging and increasing the efficiency of the ventilating system.

Although electricity has made great strides in the coal mining districts, it has not as yet covered the field as thoroughly as it can with profit to the mine owners. In some places coal cutting and hauling is done by electricity, while pumping and hoisting is done by steam. In other places compressed air, electricity and steam are used to perform the various operations, while in some cases the list of motive power is increased by the addition of mules. Now it is quite evident that greater economy of operation could be obtained by centralizing all the power in a single station and distributing to the points when required by means of electricity. In this way the cost of producing a unit of energy would be reduced, even if the coal consumption were not considered as a factor, because the number of men required to do the work in the central station would be less than that used when a number of engines are scattered around the premises; and the cost of keeping the wiring system in repair would be much less than is required for steam and compressed air pipes.

There is another class of mining, namely, gold and silver, in which electricity can accomplish just as good results as in the coal industry, although not on such an extensive scale, simply because the field is more contracted; but the benefits accruing to the users would be just as great. Most of such mines are located in places where steam power cannot be obtained economically. The site may not be accessible by railroads, or even good wagon roads, and in such cases the cost of energy is largely increased by the high rates paid for the transportation of fuel. In other cases water for the boilers can only be obtained by transporting it by mules or wagons, or by a more or less expensive pipe system. But in nearly if not all such cases, a site can be found within reasonable distance from the mines, say 10 to 15 miles, that would be accessible by at least good wagon roads, and where an abundant supply of pure water could be had. In some places, by going such a distance, even a good water power would be available. In all localities of this character it would be found profitable to locate a power plant at the available site and convey the energy by wire to the mines. If the district were one where there were a large number of mines owned by different individuals or corporations, it would, no doubt, prove a paying investment for an independent corporation to put up the power plant; this would be unquestionably true if a good water power could be found within a reasonable distance.

Such an application of electricity would prove a paying investment simply on account of the difference in the cost of energy delivered at the mine; but if there is much pumping to be done, and especially if it is deep pumping, the advantage of electricity would be most decided. In fact, deep pumping can be done by electricity at a much lower cost than by any other method, even if the initial cost of energy is greater. The way that is generally conceded to be the most efficient for doing this kind of pumping by steam is by means of the old Cornish system; but the cost of the apparatus is so great as to preclude its use in the great majority of cases. Where steam pumps are lowered into the mine the loss by radiation from the pipes conveying the steam from the surface becomes so great as to render the cost of operation so much more than it is by the Cornish method as to wipe out the advantage of cheapness; so that there is little choice between the two. The loss by radiation may be largely reduced by lowering the boilers into the mine as well as the pumps; but this would require lowering the fuel and possesses other disadvantages which would about balance any apparent gain.

An electric pump would work about as efficiently a thousand or two thousand feet under ground as upon the surface, the difference being only the slight extra loss in conveying the current this distance, and this could be kept within 2% or 3%; therefore for this class of work electricity is far superior to steam. Owing to this fact, it would be found profitable, even when the steam plant is located at the mouth of the mine, to use an electric pump. But the use of a pump would render an electric generator in the engine-room necessary, and having this it would be possible to do the hoisting by electricity; and if a number of hoists are used, the latter method would be found by far the most economical. Having gone this far, and having electricity on tap, so to speak, it could be used at a comparatively small outlay and running expense to light up all parts of the mine, and thus increase the amount of work done by the same number of men by reason of having a superior illumination. Furthermore, with such a system, properly installed (and the expense would not be heavy), power would be available in any part of the mine, for any purpose for which it might be desired.

From a consideration of these facts, the natural conclusion must be that electricity can be advantageously used in this class of mining, either by reducing the initial cost of power by generating it at a distance from the mines, where the conditions are more favorable for the economical development of energy, or by the conversion of the steam power produced at the mouth of the mines into electric energy, thereby saving the enormous loss in transmission when steam is conveyed to the point where the power is required.

Welding Lead.—An ingenious method of welding lead has been recently devised by M. Blondel. The surfaces to be joined are carefully cleaned and between them is placed a thin layer of lead amalgam. On passing an ordinary soldering iron along the line of junction, the mercury of the amalgam is vaporized, and the lead, set free in an exceedingly finely divided state, fuses and unites the two surfaces together.

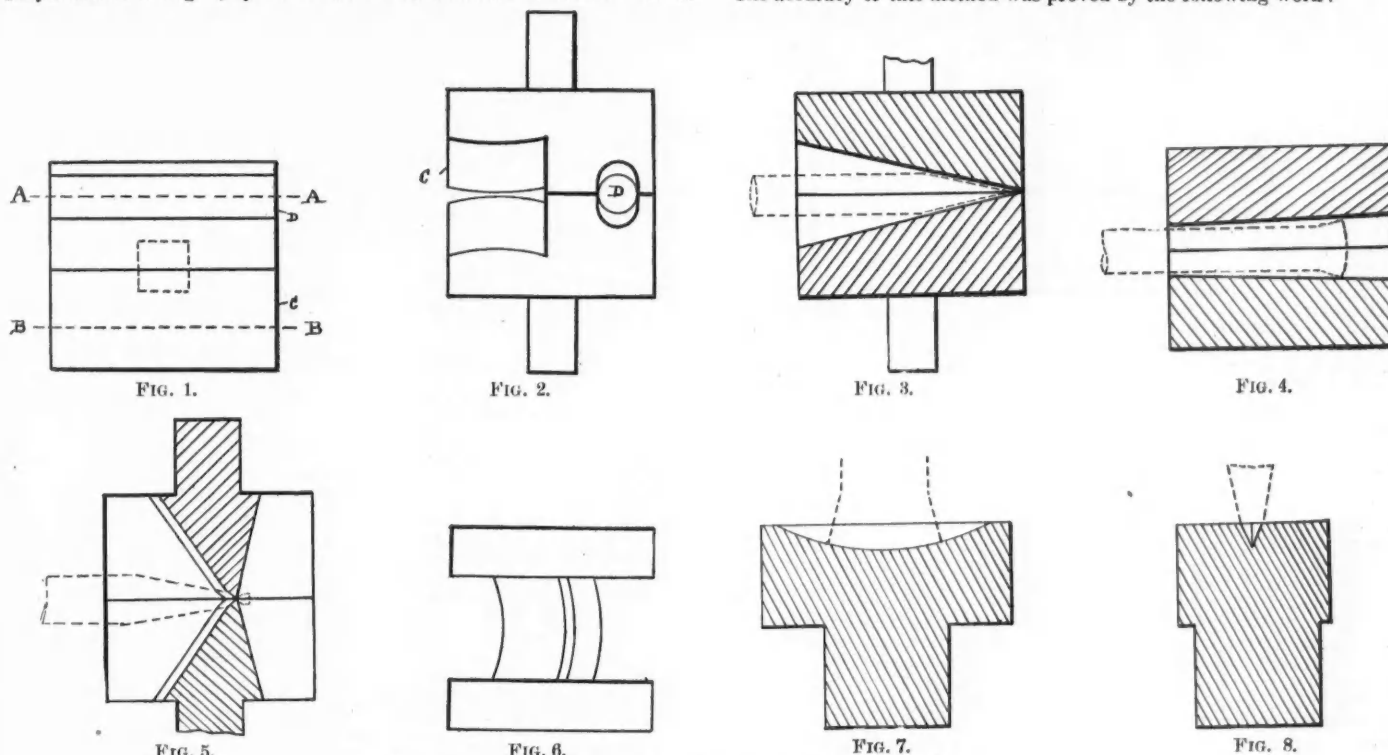
Electric Traction.—The Columbus, Hocking Valley & Toledo Railroad Company has, it is reported, adopted electricity for a feeder line 22 miles long, from McArthur Junction, on the main line, to Jackson, O., and the Westinghouse Electric Company has the contract for equipping the road and power house. The road will open up large coal-fields at Wellston and the mines of the Superior Coal Company. The road is laid with 60-lb. rails, and it is estimated that a speed of 30 miles an hour will be maintained with heavy freight trains. For the passenger service light motor cars of 75 H. P. and 11 trailers are being built. The motor cars are 38 ft. long, and the seats are placed the same as in a passenger coach used on railroads. The electricity will be fed with a trolley as on the Mount Holly, N. J., branch of the Pennsylvania Railroad. This is the first electric road built in Ohio by a railroad company operating by steam.

BRADBURY'S MINING DRILL MAKING AND SHARPENING MACHINE.

This machine for making and sharpening miners' drills has during the last year or so met with great success in the Transvaal, where it has been tried with the most satisfactory results at most of the leading gold mines such as Robinson, Langlaagte, Primrose, etc. It is now being introduced in England, and a company has been formed in London to negotiate for the sale of patents throughout the world. In America several machines have been invented from time to time to replace smith's work, with varying success, but here as in most other mining districts of the world, the hand sharpening of miners' tools is still generally preferred. The Bradbury machine has, however, proved its value in the Transvaal, so that it is well worth the attention of mining men in this country, as well as in Australia, England and other mining countries.

The apparatus in this machine consists entirely of sets of dies which are operated by steam hammer power, and the process consists of a shaper, a gauger and a cutter; besides, there is a finishing die, the power for which is supplied by hand. The accompanying illustrations show the dies only; we do not think it necessary to show the machine or the mountings. Fig. 1 shows an elevation of the dies, which comprise the shaper and gauger, the shaping surfaces being at C and the gauging surfaces at D. Fig. 2 shows a plan of the bottom die; Figs. 3 and 4 are vertical sections through the shaping surfaces and through the gauging surfaces, respectively, along the lines BB, AA, in Fig. 2. Figs. 5 and 6 show vertical sections of the cutting dies and a plan of the lower cutting die respectively. Figs. 7 and 8 show two vertical sections through the finishing dies, being drawn to double the scale of Figs. 1-6.

The old drill or the new rod is first heated and then flattened by the shaper dies as in Fig. 3, by one stroke of the hammer. It is then cut to



BRADBURY'S MINING DRILL MAKING AND SHARPENING MACHINE.

the correct shape in the cutter dies as in Fig. 5; these dies not only cut off the rough end but form the short bevels, all in one blow. The drill thus formed is then brought between the gauging surfaces of the combined cutter and gauger dies as in Fig. 4, in order that the width of the drill shall be made the exact size to fit the diameter of the holes used in drilling the rock. When the drill is accurately gauged it is removed to the finishing dies shown in Figs. 7 and 8, and the burrs left from the cutting operation are forced back into the metal by a few smart blows with a hand hammer brought down on the head of the drill.

It is usually supposed that in sharpening drills it is necessary to use a series of light hand blows on the drill in order to make the metal hard and compact, and therefore mechanical sharpening is not at all in favor, but this machine apparently effects this end by its single blows, and so removes the chief objection which miners have against mechanical sharpening. It is obvious that this machine will sharpen drills at quite a different speed from what is possible with hand labor, and also that the amount of skilled labor required is very much reduced.

Spanish Coal Exports.—The exports of coal in 1895 from the various collieries of Asturias were as follows:

Colliery	Tons.
Espanola	96,056
Union Huilera	76,484
Turon	41,390
Martinez Rivas	30,900
Mieres	25,860
Asturianos	20,545
Herrero	20,145
Duro & Co	15,000
Carmona & Co	11,200
Vicente Neapral	7,000
Benigno Alonso	5,000
Various	7,422
Total	397,012

THE ESTIMATION OF PYRRHOTITE IN PYRITES ORES.*

BY EDWIN F. CONE.

Some of the American pyrites ores contain the mineral pyrrhotite (Fe₇S₈) in varying proportions. In the manufacture of sulphuric acid from these ores it is found impossible to burn out at least the greater part, if not all, of the sulphur which is present as pyrrhotite. In the estimation of total sulphur in the sample of such an ore, of course the sulphur present as pyrrhotite is included. It is, therefore, necessary, in order to make a settlement with the company selling the ore and also in order to figure the yield of acid, to estimate the sulphur present as pyrrhotite as accurately as possible. Authorities give no method to meet the conditions. After a careful investigation of the matter I have perfected the following method; I am indebted to Mr. Lucius Pitkin, of New York City, for some valuable suggestions. It is based on the fact that Fe₇S₈ is magnetic, pyrites being non-magnetic.

Method.—After the ground sample has been passed through a 60-mesh sieve, 13.74 grams are weighed and spread out upon a good-sized sheet of glazed paper. A magnet is passed through and over this several times, the magnetic portion being carefully separated from the magnet by first stroking suddenly the top of the magnet, which dislodges most of the mechanically admixed pyrites, and then, secondly, separating the magnetic portion by means of the armature and a brush. The process is carried out five or six times, enough separations having been made to have reasonably separated all the magnetic portion. This is then finely ground in an agate mortar, and the sulphur estimated gravimetrically by oxidation with nitric and bromo-hydrochloric acids. The weight of barium sulphate obtained in grams is the percentage of sulphur present as pyrrhotite.

The accuracy of this method was proved by the following work:

A sample of ore containing a known percentage of pyrrhotite was obtained. It analyzed as follows:

	Per cent.		Per cent.
Total sulphur	35.07	Sulphur present as Fe ₇ S ₈	24.14
Iron	57.50	Iron	26.96
Oxygen as Fe ₂ O ₄	4.26	FeS ₂	9.34
Copper	0.25	Sulphur	10.68
Insoluble matter	2.78	Iron	11.20
	99.86		

A sample of pyrites containing no pyrrhotite nor magnetic portion was then obtained. To a definite portion of this I added enough of the ore containing pyrrhotite to give 1.20% of sulphur present as pyrrhotite in the mixture; i. e., to 50 grams of the pyrites I added 2.63 grams of pyrrhotite ore, or

$$\frac{24.14 \times 2.63}{52.63} \times 1.20\% \text{ sulphur as Fe}_7\text{S}_8.$$

This mixture was then analyzed for sulphur present as pyrrhotite by the method described above, using different weights. Some of the results obtained are:

5.00 grams gave 0.4120 barium sulphate	= 1.13% sulphur as Fe ₇ S ₈ .
13.74 " " 1.1300 "	" = 1.13% " Fe ₇ S ₈ .
25.00 " " 2.1570 "	" = 1.18% " Fe ₇ S ₈ .

Others were equally concordant.

The method was also applied to the pyrrhotite, as mentioned above, using portions of one gram or one half-gram, giving respectively 24.13% and 24.15% sulphur as Fe₇S₈.

This method is accurate to within 1/2% on ores containing much or little pyrrhotite. The ore must not be finer than that which will pass through a 60-mesh sieve; if it is, results will be unreliable.

*Journal American Chemical Society.

Another method which I used until the perfection of this one, is based upon the fact that Fe_2S_3 gives off hydrogen sulphide with dilute acid, whereas FeS_2 (pyrite) does not. This is reliable when no other sulphides are present, but as most pyrites contain blende the results are usually unreliable.

MINING AND TREATMENT OF THARSIS COPPER ORES.*

By C. F. Courtney.

At a recent meeting of the Institution of Civil Engineers, in London, a paper by Mr. C. F. Courtney, M. I. C. E., was read on this subject.

The Tharsis mines are of great antiquity, and their history could be traced even so far back as the Stone period. The property of the present company, which was formed in 1886, consisted of six lodes at Tharsis, the main establishment, the Calanas lode, 18 miles distant, and the Lagonazo mine, 5 miles distant. These lodes formed part of the great deposits of cupreous iron pyrites inclosed within a zone of clay slate, between 110 miles and 120 miles in length, extending, in a northwesterly direction, from near Seville into Portugal. The masses of ore were of great size and of a lenticular form, parallel to the inclosing slate. The upper portion contained as much as 3% or 4% of copper, while at the depth of about 350 ft. the amount diminished to $\frac{1}{2}$ %.

Three methods of mining had been employed. By the pillar-and-stall system about one-third of the mass could be extracted without the necessity of supports, the ore being very compact. Each floor was 33 ft. high, and parallel galleries were driven through the lode 16 ft. high by 16 ft. wide, and 83 ft. from center to center. The partitions were broken through in stalls 15 ft. wide and 33 ft. apart, the stall of one partition facing a pillar in the opposite partition. A fall of not less than 1 in 500 was allowed in the direction of the shafts to which the ore was drawn by mules, in wagons of one ton capacity, along a 2-ft. line. The large amount of ore left in the lodes after working had led to the adoption of the second method, that involving the removal of the overlying rock. The open casting of the lodes had been in progress many years, and the amount of material removed from the surface of one lode in one year had reached 654,000 cu. yds. The overburden was divided into floors, 33 ft. high, leaving a slope of 60° and a bank 13 ft. wide; the average batter was thus 45°, allowance being made for the varying conditions of the foot-walls. After the removal of the overburden, the extraction of the mineral was rendered easier. Each miner could blast down 8 tons at a wage of 2s. 8d. per day, as compared with 2 tons in underground working at a wage of 3s. per day: while the consumption of dynamite was about 0.10 lb. per ton, instead of 0.18 lb. in underground workings. The third method, which had been adopted in the case of only one of the lodes, was an adaptation of the long-wall system, and permitted the removal of the whole of the ore by underground working. The lode was divided longitudinally by diaphragms in walls, the excavations starting at the lowest level and proceeding upward between each wall, a space being left equal to its thickness, afterward to be filled up with loose rock or earth as the overhead extraction continued.

The output from each shaft was between 900 tons and 1,000 tons per day, the average depth being 295 ft. The ore was emptied from the wagons by tumblers, and, in order to cleanse the portion intended for exportation, the shoots, set at an angle of 36°, were made in the form of screens with $\frac{1}{2}$ -in. spaces. The "smalls," about 17% of the total weight, were conveyed to the local treatment ground, the ore for local treatment being crushed to the required size by Blake stone-breakers.

The old method of treating the ore was by calcination: the sulphide of copper was converted to cupric sulphate, which could be readily washed out by fresh water. Triangular heaps, 8 ft. high, containing about 330 tons, were built, having a series of dry-stone flues and chimneys, and with mounds of 90 lbs. of brushwood placed at intervals of 13 ft. These heaps were burnt for about six months, during which time they lost 12% in weight, 84% of the copper being rendered soluble. When cold, the heaps were broken open and the ore was conveyed to the dissolution tanks, in which six or seven waters were sufficient to extract the copper. The resultant liquors were passed to a settling-pond, to be drawn off as required by the precipitating plant. When the amount of copper in the ore was reduced to 0.20%, the washed ore was removed. By this process between 2½ and 3 tons of iron were used to produce 1 ton of copper, the quality of the precipitate often not reaching 60%; but it had been found that by passing the liquors over the calcined ores over the crude "smalls" as a filter, the ferric sulphate readily turned to ferrous sulphate as the copper was taken up, and the consumption of iron in the precipitation had been thus reduced to 1½ per ton of copper, and the grade of the precipitate raised to 80% cu.

To prevent the evolution of fumes of sulphurous acid gas, a process of natural oxidation had been at work for four years, the ore being treated, in heaps of large area and not more than 33 ft. deep, on a site laid out in a network of dry stone culverts for ventilation and drainage. Oxidation was encouraged by intermittent washings with fresh water, and the temperature of the mass rose to its maximum of 120° Fahr. in six months. From ores containing about 1½% of copper, 45% could be washed out in the first year, 20% in the second and 10% in the third.

The quantity of water required was 440 gals. per ton of ore for the first year, 220 gals. for the second year, and 110 gals. for the third year. If the amount of ore laid down for treatment each year were constant, during the third year, the largest consumption of water would take place. As not less than 250,000 tons of ore were annually placed under treatment, besides 300,000 of cupriferous schist, large storage reservoirs were required to enable the work to be carried on without intermission during the dry season, which fell between the months of June and October. Provision had therefore been made in Tharsis alone for the storage of upward of 572,000,000 gals. of water brought to the reservoirs by many miles of catch water drains.

The copper was precipitated from its liquor by passing it over pig iron laid in a double layer in canals of creosoted timber, 2 ft. 9 in. wide, with a depth of 9 in. If the fall of the ground permitted, about half the total length was laid with a fall of not less than 1 in 200, a quarter of the

length following with 1 in 100, and the remainder with 1 in 50. This arrangement permitted of a gradually increasing agitation of the liquors as they advanced and became poorer in copper, thereby improving and enriching the precipitate produced. The copper was almost all precipitated. The annual production of the metal by the company amounted to about 10,000 tons.

The mines at Tharsis were connected by a 4-ft. gauge railway with the port of embarkation, where provision was made for the storage of 30,000 tons of ore to insure the continuous loading of vessels in which it was exported to Cardiff, Newcastle-on-Tyne, Glasgow, and other ports for the production of sulphuric acid, being afterward returned to the works of the Tharsis Company for the extraction of copper, silver, and gold.

THE METRIC SYSTEM.

Herewith we give the full text of the bill reported to the House of Representatives on the above subject.

Fifty-fourth Congress, 1st Session. H. R. 7251. [Report No. 795.] In the House of Representatives, March 16th, 1896. Mr. Charles W. Stone, from the Committee on Coinage, Weights and Measures, reported the following bill in lieu of H. R. 2758, which was referred to the House Calendar and ordered to be printed: A bill to fix the standard of weights and measures by the adoption of the metric system of weights and measures. Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that from and after the first day of July, eighteen hundred and ninety-eight, all the departments of the government of the United States, in transaction of all business requiring the use of weight and measurement, except in completing the survey of the public lands, shall employ and use only the weights and measures of the metric system.

Sec. 2. That from and after the first day of January, nineteen hundred and one, the metric system of weights and measures shall be the only legal system of weights and measures recognized in the United States.

Sec. 3. That the metric system of weights and measures herein referred to is that in which the ultimate standard of mass or weight is the international kilogram of the International Bureau of Weights and Measures, established in accordance with the convention of May twentieth, eighteen hundred and seventy-five and the ultimate standard of length is the international meter of the same bureau, the national prototypes of which are kilogram numbered twenty and meter numbered twenty-seven, preserved in the archives of the office of standard weights and measures.

Sec. 4. That the tables in the schedules annexed to the bill authorizing the use of the metric system of weights and measures passed July twenty-eighth, eighteen hundred and sixty-six, shall be the tables of equivalents which may be lawfully used for computing, determining and expressing the customary weights and measures in the weights and measures of the metric system.

RAILROAD CONSTRUCTION IN AUSTRALIA.

In West Australia railroad construction has been ingeniously reduced to a very low figure by the contractors. Last year tenders were invited for the construction of a railway from Mullewa to Cue, to open up the Murchison and Yalgoo gold-fields. The railway was to be about 196 miles in length, and in the middle of December the contract was awarded at £84,535—about £431 per mile. "They must be mad," some reader may involuntarily exclaim. Not so. At any rate, if they be there is method in their madness. This is not the first experiment in West Australia at constructing railways at almost incredibly low prices. Some months ago Messrs. Wilkie Bros. undertook to construct a railway from Southern Cross, the then terminus, to Coolgardie—a distance of 115 miles—and the contract worked out at £560 per mile, including station buildings, goods sheds, and, indeed, everything except rails and the fastenings. This was £310 per mile under the lowest price on record, and now the Cue contract has been placed at £129 per mile less.

How can contractors build railways fit to travel upon at such a price? It is managed in this way. The railway toward Coolgardie was opened in January to Woolgoolie—roughly speaking, 80 miles beyond Southern Cross and 40 miles from Coolgardie. The contractors will hand over the first half of the line at the end of this month, but they will operate the remaining 60 miles on their own account until next September. This is the whole explanation. Trains are now running to the outskirts of Coolgardie and the contractors will have nine months' traffic receipts to set off against the absolute loss they sustain on the construction of the line. A correspondent writing from Perth, the capital of West Australia, states that it would have caused no surprise had the lowest tender for the Cue contract been £200,000. The actual tender at £84,535 is obviously based on very large receipts from traffic during construction. At the present time the business on the Cue road is much smaller than on the Coolgardie, but every month it is increasing.

The low cost of construction has rendered it a comparatively simple matter to make the railways of West Australia pay a high amount of interest on the capital invested. It was not always thus, for in 1889, when 188 miles were in operation, the gross earnings were £6,500 less than the working expenses. In succeeding years a gradually increasing balance of revenue was shown, until for the financial year ending June 30th last the return was 5.44%—a much greater return than is yielded by the railways in other parts of Australasia. The average cost of construction of West Australian railways is £3,804 per mile. The cost of the railways of the other colonies are: Queensland, £6,902; South Australia, £7,297; New Zealand, £7,771; Tasmania, £3,382; Victoria, £12,570; New South Wales, £14,335. As regards the percentage of working expenses to receipts, the figures, 61.50, show that there is room for economy. New South Wales, with a percentage of 56.58, stands the best of all the colonies with respect to this. Tasmania makes a most miserable showing as regards her railways. She swallows up 85.02% of her gross receipts in working expenses, and her return upon railways is 0.61%.

Electricity in Russia.—Russia, it is said, is to have an electrical branch of her army under the direction of a lieutenant general, two major generals and five officers of lower grade, who will also have a military electrical school under their charge. Russian military officers have always been very adept in the use of electricity.

* Abstract of paper read before the Institution of Civil Engineers.

REUBEN RICKARD.

The intelligence cabled from Coolgardie, Western Australia, that Reuben Rickard died on Thursday, February 27th, came with shocking unexpectedness to his friends and relatives. Some men have such an air of overmastering vitality and show such cheerful disregard of the smaller ills of life that the very thought of them is associated with a sunny, unclouded existence. The news of the stilling of a kindly voice, and the removal of a strong personality, comes in such cases with a feeling of incredulity less likely to be evoked when we hear of the death of those on whom sickness is accustomed to lay heavy hands. And, in an instance like this, when a friend is called away while in distant lands, without the chance of bidding one farewell to those he loved, the untimely close of an active and useful life is tinged with added sadness.

Amid the mining regions of the West, and indeed the wide world over, there are so many friends of Mr. Rickard who will mourn his death, that a few words will be welcomed by them.

He was born on August 28th, 1841, the son of Capt. James Rickard, of Porthtown, Cornwall. His father was one of the first English mining engineers to undertake professional work in California, whither he went in 1850. On both his mother's and his father's side he was descended from families which for generations had directed the development of the classic mines of Devon and Cornwall. When his father, in 1853, undertook the management of the mines and smelter of Pontgibaud, in France, he accompanied him. In those days a technical training was neither as necessary nor as easy to obtain as it is now. In lieu of it, however, there existed the beneficent old custom of apprenticing youngsters to their elders. The training obtained under such a man as his father was sufficient to give Reuben Rickard a practiced intelligence and a thorough knowledge of his profession such as received ample testimony in the many incidents of his useful career.

In due time he followed his father in the charge of the smelting establishment at Pontgibaud and directed its operations with such skill that in 1875 he was offered the management of the Richmond Consolidated Mining Company at Eureka, Nevada. The magnificent production of that celebrated mine and the profitable operations of its smelting works were largely credited to his energy and experience. In 1881 he severed his honorable connection with Eureka and retired to a pretty home at Berkeley, Cal., whose unusual educational facilities he utilized for his children. During the following year his professional activity was carried on among many of the best known properties of the West, and his stout, cheery presence became familiar in the mining centers. From 1890 to 1894 he ceased to travel, preferring the quiet of home life and amateur gardening which rendered his house at Berkeley so well known to those who visited that university town. In March, of last year, his wife, a woman beloved for her saintly nobility of character, died, while on a visit to his brother, Alfred, at Central City, Colo. This broke up his home and caused him to re-enter the profession from which he had retired. From June to September he had charge, in the absence of his brother, of the Gold Coin Mine in Colorado, and on being asked to go to Western Australia to examine and start the exploitation of certain discoveries of alleged great value, he sailed from San Francisco on November 10th, reaching Perth on December 21st. In a letter received a few days ago he spoke of the excessive heat and of the difficulties which he expected to meet on reaching the diggings at Coolgardie. Yet the tone of resolute cheerfulness and self-reliant confidence, the fruit of a long service in the West, were evident in this letter and bespoke the resourcefulness which had always made him in character so much of an American. Then came the brief cable from the agent at Coolgardie stating that he had died of dysentery doing his duty at the cost of his life.

Mr. Rickard leaves two sons and a daughter. Both sons graduated at the University of California, and, in accord with the unbroken traditions of their family, have become mining engineers. To both of them their father was a friend no less than a parent, and to both his character will be a real influence while life lasts.

Reuben Rickard was a man of wide usefulness, for, beyond the calls of his profession, he was a business man of unusually clear sense, whose advice was much sought. He took a keen interest in the growth of the University of California and in the well-being of the community in which he lived, and was twice chosen mayor of Berkeley. And so, amid the sorrow of sudden bereavement there must come to his friends the consciousness of a life well spent, useful and beneficent, and of an example marked by a manhood strong and sturdy, keen and capable, softened by a good nature and kindness of heart which looked out from the big brown eyes with a cheery greeting that never dimmed until death closed them forever.

T. A. R.

SODIUM IN ALUMINUM.

A paper, "On the Presence of Sodium in Aluminum produced by Electrolysis," was read at the recent meeting of the Academie des Sciences, Paris, by M. Moissan, of which the following is an extract:

The results, the author stated, obtained by many experimenters into the properties of aluminum have been of a very varied and often contradictory character. In several countries endeavors have been made to utilize aluminum on account of its lightness, in the form of culinary and other utensils, and so lighten the equipment of soldiers. Here, again, varying results have been obtained; in some cases the metal has been found to give such good results as to warrant its extended use, but in others it has proved deceptive. These difficulties are due principally to differences in the composition of aluminum as made for commercial purposes. In July, 1894, M. Moissan demonstrated that it is possible for aluminum to contain nitrogen and carbon, and he has shown that the presence of these bodies greatly modifies its properties. M. Moissan has recently had occasion to analyze samples of aluminum obtained from three of the largest existing aluminum works at La Praz, France, Neuhausen, Switzerland, and Pittsburg, U. S. A., and it is the result of these tests that he communicated in the paper under notice. The author stated that he found in the aluminum a new impurity, which appears to him to have an important effect on the conservation of the metal, the impurity in question consisting of sodium. The presence of this impurity in aluminum may be determined in the following manner: Place 250 grammes of filings, carefully prepared, in an aluminum bottle containing 300 cu. cm. of distilled water, the latter to be prepared, in a metallic still. This mixture, together with the bottle, is placed on one side for a couple of weeks; it, however, being caused to boil every day. The contents are then passed through a filter and washed in boiling water. The remaining liquid, which is slightly alkaline, is then evaporated to dryness in a platinum capsule. It is next heated up to a dark red, the mass becoming brown in color. Dilute pure hydrochloric acid is then added, when carbonic acid will be given off. The mass is again evaporated to dryness, then heated up to a temperature of about 300° C., in order to drive off the excess of hydrochloric acid. When this is done there will be a residuum presenting all the characteristics of chloride of sodium. This is taken up by water and the quantity of chloride in the form of chloride of silver estimated. From the weight of this latter body the quantity of sodium taken up by the water from the aluminum filings may be deduced.

In the course of his experiment, M. Moissan has traced the presence of sodium in quite a number of samples of aluminum, the contents varying from 0.1 to 0.3%. An old sample of aluminum was found to contain 0.42%. The presence of sodium in aluminum shows that the electrolytical action of a mixture of cryolite and alumina gives rise to a number of secondary reactions, in which sodium may play a variable part, according to the composition of the bath and the intensity of the electric current.

The effects on the properties of aluminum when sodium is present, M. Moissan finds are that cold water will attack aluminum, at first slowly, followed by progressively increasing intensity. In fact, if a sheet of aluminum is surrounded by a small volume of water, it will be found that a thin layer of alumina will be formed on the metal. Allowing the metal and water to stand undisturbed for a short time, it will be seen, after a few days, that the liquid has an alkaline reaction on sensitive litmus paper. From that time forward the decomposition of the metal becomes very rapid. On every part of a piece of aluminum containing sodium alkali is to some extent formed, which reacts on the metal, giving an aluminate. This aluminate of sodium can afterward be separated by water, giving a sediment of alumina and soda.

It will be apparent from the foregoing that the alloys which it is possible to prepare with aluminum will possess very different properties, according as the metal contains a slight percentage of sodium or not. In this connection it may be stated that M. Riche, in his work on alloys of tin and aluminum, has shown that these alloys decompose water at ordinary temperature. M. Moissan succeeded in preparing an alloy of 6% of tin with aluminum entirely free from sodium, and under these conditions, after being immersed in ordinary water for a period of two months, the metal became spotted at several points, and gave some efflorescences of alumina. No gaseous vapor was, however, given off. This experiment was carried out as follows: Aluminum, free from sodium, was alloyed with 6% of tin, while shielded from the action of nitrogen and the furnace gases. A sheet of this metal was divided into two parts. The first piece was placed in the river Seine, where the water is agitated each day; the second piece was placed in a Bohemian glass containing Seine water, on which was a layer of oil several centimeters thick. The average



REUBEN RICKARD.

temperature in the laboratory was about 20° C. The experiment, which was commenced in September last, was carried on over a period of two months. During this time the aluminum became covered with white efflorescences, it became spotted over nearly the whole of its surface, but in neither case were any globules of hydrogen given off. It was found that the piece of aluminum placed in the river was most rapidly attacked. This experiment was made on an aluminum containing only a small proportion of tin. M. Riche has, however, shown that with a greater percentage of tin the alloy more readily decomposes water, and it was upon this fact that M. Riche based his statement that aluminum could not be reliably welded by an alloy containing tin.

The presence of sodium in aluminum has no doubt greatly contributed to its discredit under government tests for shipbuilding and other purposes, the result in several cases that have been reported is that decomposition was too rapid when exposed to the action of sea water to allow of the metal being used.

MODERN ROPEWAY PRACTICE.

As we remarked in one of our recent issues, the development and perfection of this system of transportation have been brought to such a pitch that it seems impossible to expect more. A description has just reached us of a recent installation at Empire, Nev., by the Vulcan Iron Works of San Francisco, which deserves special mention. The low cost of transportation per ton, owing to automatic appliances for loading, carrying and dumping, will always prove most attractive to the mine-manager or superintendent of works. In the case in point the conveyance of a daily tonnage, more than the product of most mines had to be accomplished, and at as low a figure as possible, as the material to be conveyed and treated consisted only of tail-

ings, the loading terminal, which consists of the terminal machinery and framework proper, an automatic loader, a small storage bin of about 20 tons capacity to supply the loader and an elevator to raise the tailings from the ground into the bin. The tailings, as they are brought to the loading terminal, are dumped into the boot of the endless chain-bucket elevator, and from thence elevated to a height of some 30 ft. and dropped into the bin.

The loader consists briefly of the stationary hopper, the traveling hopper and means whereby an exact load for a bucket on ropeway, and that is contained in stationary hopper, is automatically transferred to the traveling hopper and from hopper to the ropeway bucket. All this is accomplished by one man, who handles the lever which controls the gate of the storage bin.

The elevator and automatic loader are both driven by means of gearing from terminal machinery proper.

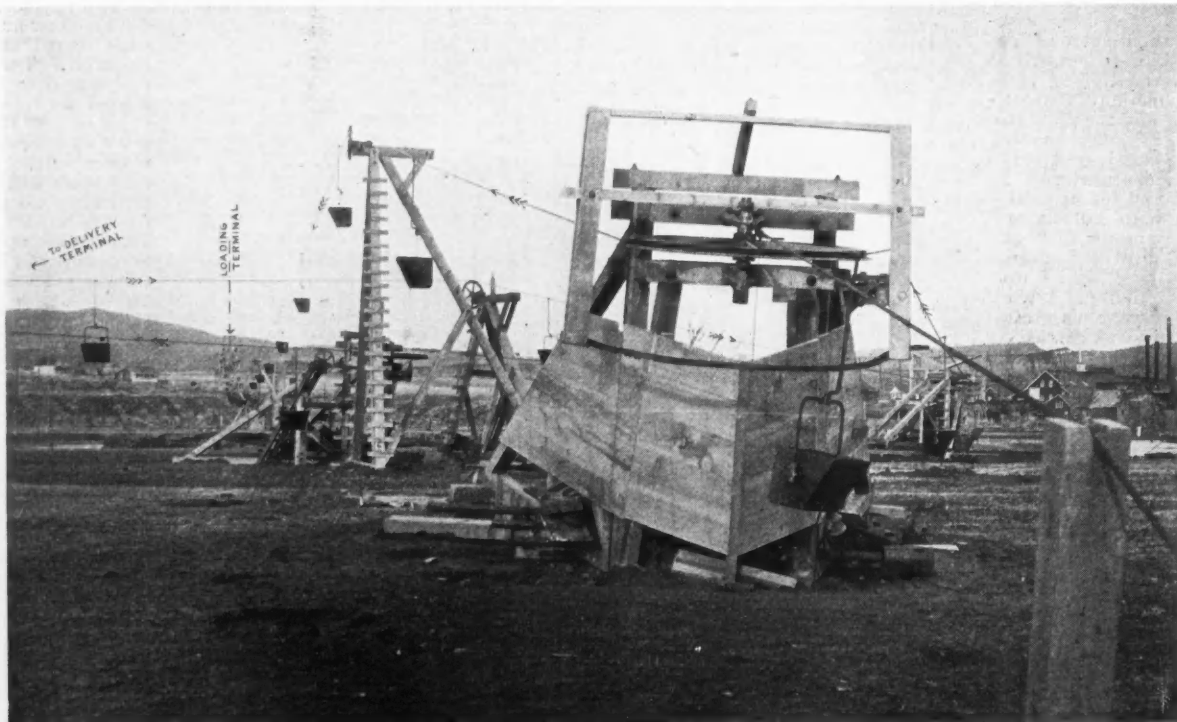
The buckets, loaded in the manner just described, and fastened to the endless moving wire rope, are carried into the mill building and there dump their loads of tailings automatically, into the large storage bins inside the mill. This ropeway, being built on a practically level country, has to be operated by some auxiliary power, and hence is connected to the mill machinery by a ropedrive, about 8 H. P. being required in all.

The total operating expense for loading, transferring and dumping the 200 tons daily is stated to be the labor of one man plus the cost of 8 H. P.

The total cost of the ropeway erected in running order, but not including freight, was approximately \$9,000.

IRRIGATION IN EGYPT.

Much attention has recently been called to the successful result of English administration in Egypt, from a financial point of view. Taxation has been lightened, revenues have found their way into the treasury in



THE TURN.

ings, considered at the time they were made as worthless or nearly so, and the possibility of their being turned into money at any time was looked upon as problematical and in the far distant future. Yet these tailings up to 200 tons a day are being conveyed nearly one mile at a cost of about 2½c., or, let us say, 3c. per ton. The conditions of treatment and final extraction of values, as they would say in the ring, "a fight to a finish," are totally different to what they used to be. Tailings already fit for one of the leaching processes, or by the effect of weathering, susceptible of close amalgamation, can be handled successfully now at a very low cost.

The ground between the tailings pile and the Mexican mill, on, where the metallurgical part of the work is to be carried is nearly level, and the ropeway crosses the Carson River. Particular attention may be called to the fact that the ropeway runs in a straight line and then makes a turn or angle of 60 deg., running thence directly to the "loading terminal," where the tailings are loaded onto the ropeway. The turn is well-planned so that the hangers of the buckets must be kept on the outside of the rope when going around a horizontal sheave, i. e., must not come between the rope and the sheave. If a turn could be made by placing a horizontal sheave in the inner angle of the outgoing rope, and likewise one in the inner angle of the incoming rope, it would be a simple matter to so make a turn. In fact, however, it is possible to so place only one such sheave and thus make a turn directly with one of the ropes. To satisfy the previously mentioned condition, it is necessary to construct a number of sheave structures outside of the line of ropeway proper, the purpose of these structures being to so lead and change direction of the other rope that it will finally start in its proper direction in the line of ropeway, with the buckets on the outside of the rope.

The method of loading the buckets is of special interest, and is one of the important features of the Vulcan ropeway. The loading is done at

place of into the pockets of tax gatherers or tax farmers, as they frequently were under the former régime, and two reserve funds have been formed, one for redemption of the national debt and the other for general purposes, part, or possibly all of which latter will unfortunately be expended on the new Soudan expedition.

It is very interesting to learn to how large an extent this renovated prosperity of the land of the Pharaohs is owing to intelligent engineering and public works carried out by a competent department. From our contemporary *Indian Engineering* we make the following extract from the last official report on the subject of irrigation, which may serve as a guide in some parts of this country:

The summer supply of Nile water in Egypt for this year, like the last two was greater than the average, and therefore the area near the tails of the distributing channels was cultivated; but unless some works for the storage of the summer supply are undertaken, there is the risk that the crops in such a remote position may have no water in succeeding years, and the over-sanguine cultivators suffer loss in consequence.

The flood of 1894 may be classed among the four great floods of the last 20 years. The distribution of the water having been improved by the works lately instituted; there was no damage to the banks and crops except the usual infiltration on a short length in the lower reaches of the river. The expenditure incurred during the flood season in watching and protecting the banks was only three-fourths of former years.

The cotton crops, although reduced 13% by fogs and ravages of worms still showed an increase of 100% in six years. Sugar cane also gave the same increase in six years. Notwithstanding the general fall in the prices of commodities these two crops were profitable to the cultivators. If the irrigation in Upper Egypt were perennial the condition of the people there would reach a state of prosperity, which those in Lower

Egypt could not possibly attain, while at present they barely subsist, and that due to the low rate of production.

The duty of water, lowered by the excess supplied for sanitary and navigation purposes, still favorably contrasts with other years.

The duty for crops is as under:

Rice requires.....	1460 cu. ft. per acre.
Wheat and pulse.....	970 " "
Taxed areas.....	360 " "

The expenditure for the year under review is £717,175, more than a half of which was spent for the Corvée Relief Fund and the greater part of the balance used for the regular budget requirements.

The drainage works were largely extended during the year; 97 miles of new channels were dug and old ones cleared out. The average cost per mile of drain is £351 and per square mile of area drained is £192. The total expenditure for drains up to date is £421,470 and a further sum of £900,000 will be required before the whole area is protected by drainage channels; but these drains cannot be made till some extensive scheme for the storage of the summer supply is taken in hand.

The various improvements in irrigation in progress or completed are as follows:

1. The enlargement of some main canals and the junction of tail ends of branches to the principal by numerous feeders; this will reduce the number and length of the branch channels and facilitate the distribution of water.
2. Remodelling some main canals by contracting the channel by spurs to render the velocity uniform and to prevent the deposit of silt in their beds.
3. Protecting the banks of main canals near the desert by plantations of grass and willows, in order to arrest the sand drifts.
4. Building regulators at the heads of the canals, so that irrigation may be effected during floods, which was impossible formerly with the old method of throwing a dam across the mouths of the canals for regulating the supply.
5. Abandoning a part of a canal which ran through low ground and obstructed the natural drainage of the land; and substituting two parallel branches on a better alignment; this gave a free exit to the drainage and improved the soil.
6. Drainage work to the district lying along a canal, which through

MINING REGULATIONS IN KOREA.

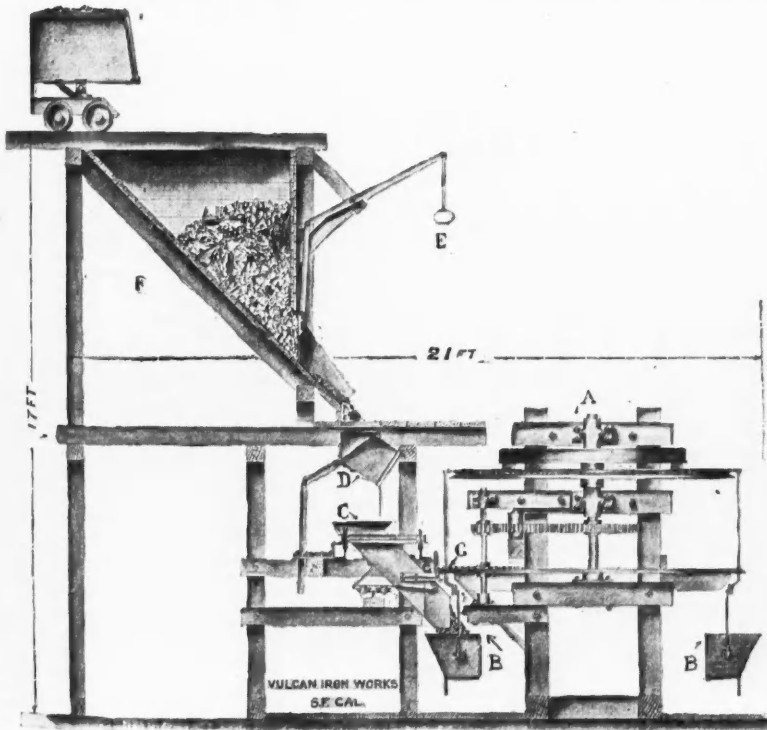
The mineral veins are not to be dug within 50 paces of a field, a grave or a house. If the graves are as thick as they are in China, this rule must be all but prohibitive; it is to be presumed that the fields or houses may be bought.

Before a gold mine can be opened it must be "traveled and examined" clearly by the Superintendent of the Mineral Bureau, by the tutor of mineral works and by other extra officials of the Department of Agriculture, Commerce and Public Works, and these will appoint other extra special officials to settle with the local authorities and then return. After these E. S. O's have arranged everything and clearly examined the mines the S. M. B. and the T. M. W. will also and again clearly examine all the mines, that is, we suppose, the sites of them, and that these operations may be commenced.

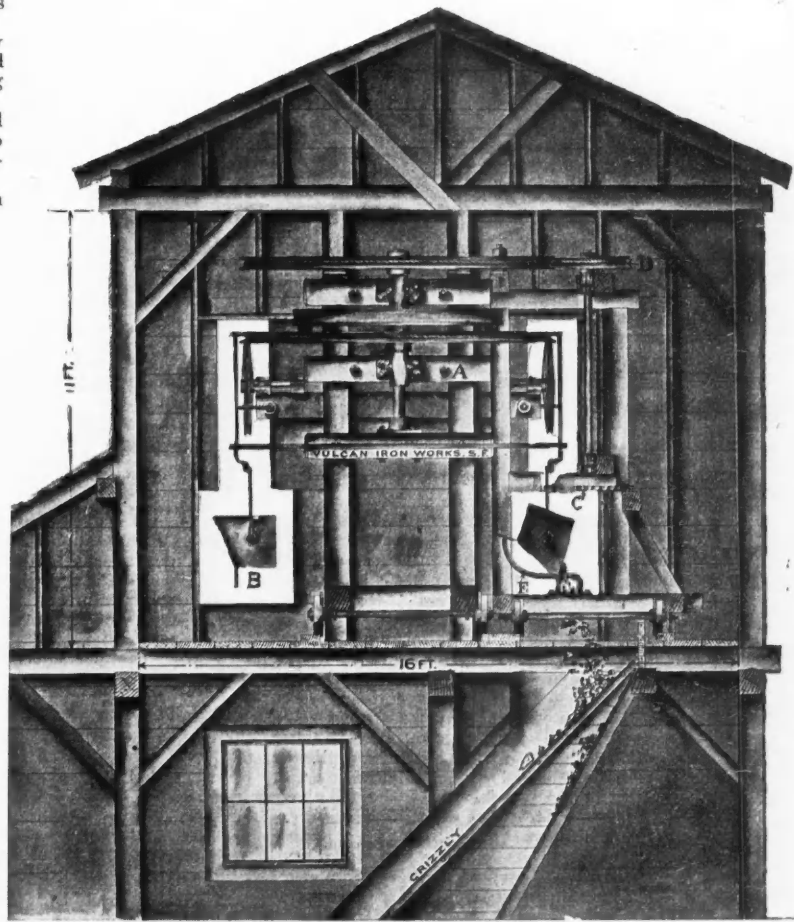
A tax collector at every mine, who will be responsible for taxes not paid, will levy 3½ pun of gold (1 pun=1 yen) from the miners twice a month, which will be collected from the leader or representative of the miners. Such representative "shall be selected chiefly by the natives" and must reside in the district unless the natives petition to have a representative from another district.

The collector will send a special officer to collect the tax, who will pay it in with a clear account once a month. The gold thus gathered must be sent to Seoul about every three months, "even if the distance is extremely far."

Scales will be provided by the Department, and receipts given and



LOADING TERMINAL.



DELIVERY TERMINAL.

infiltration had become water-logged and barren. This area formerly was very productive, but through over saturation it was allowed to remain fallow.

The most important work done during the last three years was that undertaken for the stoppage of the leaks under the floor of the Damietta Barrage. These springs were noticed on the downstream side in 1891. The cracks (upstream and downstream) were filled with sand bags and an island of earth thrown up all around them. But on account of the lightness and porosity of the material used it did not answer the purpose, and subsequently the following method was adopted and proved eminently successful: A trench was cleared of the pitching and loose soil by dredging along the upstream edge of the Barrage in front of four or five bags at a time. This trench was filled with puddled clay well consolidated by means of a sledge drawn over it, so as to form an impervious apron or curtain. Over the junction of this puddle curtain with the masonry of the floor a broad clay bank about 40 inches in height was thrown up, and its upper surface protected from erosion by sacks filled with cement concrete laid close together. For greater security a diving bell was made use of so that the surface on which the clay was deposited should be free from loose stuff and also that the sacks of cement concrete be packed as close as possible.

The cost of this work since 1891 is £20,000. It stood a pressure of about 10½ feet without showing any defect.

stamped by the collector with his own stamp. One-twentieth of the taxes will be given to the special officer for his wages and traveling expenses. The tax-collector will receive his wages and expenses in the same manner. One-tenth of taxation will be taken by the representative of miners, but not if the number of miners who are under the representative is less than ten.

All miners, cooks and water-carriers must "bear upon their bodies" wooden blocks on which tickets are pasted. These tickets will be issued monthly from the Department at Seoul; they will be plainly written and dated, and counterfoils of them will be kept by the special officer, who will receive them in accordance with his monthly return of taxes. The tickets will cost five pieces of copper money (one cent) each to the holders thereof, and should a miner be found minus a ticket his gold will be confiscated and he will be "sentenced strictly"; "not only shall the said criminal be examined seriously, but his master (representative) shall be arrested and punished."

Any miner who gets drunk or is guilty of "wicked conduct" will be punished according to the special mineral laws made by the officers or will be expelled from the "mineral place." Any native breaking these laws "shall be investigated seriously by the local authorities, and they must not be shielded." Neither will their superiors fail to be punished, for "the tax-collector or leader (representative) who escapes after having kept the taxes must be detected by every means and their security shall

be compelled to refund the amounts taken," but who or what this security is, is not stated.

For the benefit of philatelists we may mention that the Korean postage stamps "made in Washington" are: Five poon, 10 poon, 25 poon, and 50 poon (5 poon=1 cent silver).

THE HOLLOWAY-LONGRIDGE PROCESS OF TREATING ANTIMONY-GOLD ORES.

A pamphlet is being widely distributed in England by Messrs. Holloway and Longridge, drawing attention to their newly-invented process for separating gold from antimonial ores. The treatment of this class of ores is a problem which is well worth the consideration of metallurgists, for in various parts of Australia such ores are found in large quantities. It is doubtful, however, whether the process in question is adaptable to the majority of such ores. The process consists essentially in mixing a small proportion of metallic antimony with the molten sulphide of antimony and by mechanical means forcing the molten metal through the sulphide. It is found that the metal has a far greater attraction for the gold than has the sulphide, and that it will extract the gold from sulphide containing $\frac{1}{2}$ oz. of gold to the ton, even when it already carries 100 oz. of gold. The same antimony will, therefore, serve for several charges of ore. An alloy is obtained so rich in gold that the loss of antimony in recovering the gold from it is quite unimportant. This process is without doubt of value to the antimony smelter, who requires a rich ore for the production of the metal and who is thankful, in these days, to find a by-product for recovering the gold so as to give him a profit on his antimony works; but we doubt whether it would be applicable in Australia, where the stibnite is patchy and the average gold contents of the stibnite and gangue very low. In Australia the process that would pay would be one which extracted the gold and threw the antimony to waste, and the successful process of the future will probably depend on the fact that in smelting the ore in a certain manner the portion of antimony which comes off just at first contains the largest proportion of the gold.

NEW SOUTH WALES GOVERNMENT METALLURGICAL WORKS.

Ores mined in New South Wales can be tested at Duck Creek State Works, and within a couple of hundred yards of the Clyde Chlorination Works. The area of about six acres extends from the Parramatta road to the navigable waters of the creek. A siding has been put in from the train-marshaling yards at Auburn, so that material can be delivered at the works by rail or water. The first contract for the erection of the assay offices is now in progress, and the figures amount to £399 15s. 1d. The buildings cover an area of $52\frac{1}{2}$ ft. \times 45 ft., and are to be of wood on a brick foundation. When completed the existing government assay staff, under Mr. Mingaye, who now occupy premises at Circular Quay, will be transferred to these new and commodious offices. The rooms in the side fronting the Parramatta road will be devoted to the general office, the office of the metallurgist, a dark room for special work and the chemist's room. The main space of the building will be divided into two nearly equal portions, one comprising the assay furnaces, with sampling room and store, and the other a general chemical laboratory, with benches of several assistants. The present intention is that the laboratory work is to be undertaken by the existing staff, and that students will not have an entry to the offices. When, however, the metallurgical and treatment works are erected, the mining students of the University will be privileged to obtain technical experience in treating the various ores, more or less difficult, that will doubtless find their way to the works. The primary intention of the government in founding this establishment is to carry out more completely the present facilities offered by the grant embodied in the prospecting vote. The Minister, under the advice of the board, at the present time may grant permission to have a trial bulk sample treated at the Clyde, Park and Lacy's, or other works; and the cost of so doing, together with the rail charges, is defrayed out of the grant. In the new State works the skill of Mr. Taylor, the Government Metallurgist, will be availed of.

The appliances are to be of the latest and most approved type. First there will be a Clarkson's rapid sampler, in two sizes, one capable of dealing with a truck load and making a separation of 3 in. stuff, and the smaller machine will treat samples of much less bulk. In making an assay everything depends on an accurate sample being taken, and the new appliance does its work to perfection. If various quantities of lead shot, peas, and sand were thrown into the hopper without prior mixing, not only will a through mixing be made, but the required proportion of the whole, to be delivered through the delivery-shoot as a sample, will contain accurate proportion of shot, sand and peas. Another smaller instrument on the same principle will be used as a laboratory divider. The bulk ore on its way to the crushing mill will be reduced to equal-sized and coarse fragments in a Gates mill, and these will finally be ground to particles of any required fineness in a Tustin mill. This machine has a good reputation in California, and deals with ores either wet or dry. Gold will be saved from the sands in various ways: first they will pass over the ordinary mercury plates, and then through various hydraulic separators which depend upon the gentle flow of water in Spitzkasten classifiers, and other arrangements to sort out particles of different specific gravity. By this means mineral particles are separated from worthless sand, and their final treatment to get rid of valueless slimes will be conducted in vanners of various types, such as the Frue, Woodbury, Lubrig, and others. It is probable that the latest improved form of buddle known as the Bartsch vanner will be comprised in the first installation of plant. Eventually, when funds permit, there will be added chlorination and cyanide plants, and other processes as may be invented for extracting gold by solvents, together with an electrolytic plant for the deposition of the precious and other metals from solution by means of electricity. The works in their complete state will comprise every suitable method, appliance and machine used in the treatment of metalliferous ores.

The existing regulations of the prospecting board provide for the cost of treatment of bulk trial samples being defrayed out of the prospecting votes. Every miner has now the privilege of submitting trial samples in

bulk to the board, and if the board approves and so advises the minister the treatment is effected at existing works. In this new establishment the State will undertake the treatment with its own officers and with a multiplicity of appliances at their disposal such as are not usually found at private works run on commercial lines. The intention of the Government is to assist the miner with the best technical advice, so as to guide in the selection of methods of treatment at the mine and lead to proper types of batteries and plants being erected.—*Australian Mining Standard.*

Japan's Maritime Progress.—The desire of the Japanese to obtain a share of the carrying trade of the world is bringing important orders to British shipbuilders. For the new Anglo-Japanese line of the Japan Mail Steamship Company, or Nippon Yusen Kaisha, six additional twin-screw steamers will be required. One of these is being built in Japan by the Mitsui Bishi Company, and orders for the other five have just been placed with shipbuilding firms in Great Britain. Each of the new vessels will be 450 ft. in length and of 5,550 tons, the carrying capacity being 7,500 tons dead weight, and the average speed 12 knots. The *British Trade Journal* for March, which publishes these particulars, contains an account of an interview with Mr. Shoda, the representative of the Nippon Yusen Kaisha, now in England, who is concluding arrangements for the new line, and in the course of which interesting details are given relating to the new venture and to the position of Japanese trade and industry generally.

The First Armored Vessel.—A French author who has been investigating the naval records of France and Italy claims that the armored war ship is by no means the novelty it is generally supposed. Records preserved in the arsenal at Nice show that in 1530 an armored ship was built at that port; its name was *Santa Ana*, and it was one of the squadron sent by the Emperor Charles Fifth against Tunis. The *Santa Ana* was a galley armored with numerous guns and carried a fighting crew of 300 men, besides the galley slaves who worked the oars. The armor consisted of heavy plates of lead fixed to the sides of the ship by bronze bolts, and was probably sufficient to resist the musket balls and the shot from the small guns used in those days.

So the originality of Ericsson and our other modern shipbuilders disappears. If our investigators only keep on we may find that Noah plated the Ark to resist the attacks of the pirates of his day.

Contract Conditions in Cornwall.—For driving 2,000 fathoms of tunnels, not less than 6 ft. wide by 8 ft. high, by rock drills, the mines providing always two or more tunnels for that purpose, for the Basset Mines, Limited. The tenders to supply and work all machinery required, excepting the air-pipes, and to deliver the rock in wagons (which the mines will supply) to sidings within 200 yards of the tunnel end. A premium would be entertained for speed in driving, and tenders must state what is the minimum speed they will guarantee per month in each tunnel driven. In case the machinery employed by the contractor be of an approved character, the company would either take the machinery over at the end of the contract or pay the contractor a sum of £500 forfeit. Ten per cent. of the contract price to be retained by the company as security for the fulfilment of contract. Should the terms of this advertisement be in any respect objectionable to any rock-drill manufacturer or contractor to tender upon, the company will be glad to receive proposals for the 2,000 fathoms required from such manufacturer or contractor, the conditions to be stated by them in their proposals. Sealed tenders, addressed to the secretary, and marked "Tender for Tunneling."

PATENTS RELATING TO MINING AND METALLURGY.

United States.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

WEEK ENDING MARCH 21ST, 1896.

- 556,739. APPARATUS FOR JIGGING COAL. Eckley B. Cox, Drifton, Pa.; Alexander B. Cox and Henry B. Cox, executors of said Eckley B. Cox, deceased. Combination of two co-operatively-connected jigs, having fields of beds of different thicknesses, respectively, and each jig having an upper and a lower discharger of relatively different capacities, located, respectively, above and below the supporting surface of the bed; means for forcing water through the supporting bed of the two jigs, to separate and elevate, the lighter constituents of the material supported upon said bed; a conveyor in operative connection with the upper discharge of each jig; means for actuating the two conveyors at relatively different velocities; and means, in position and adapted for conveying the lower discharge of one jig to, and depositing it upon, the supporting surface of the bed of the other jig.
- 556,750. ROASTING FURNACE. John B. F. Herreshoff, Brooklyn, N. Y., Assignor to the Nichols Chemical Company, New York, N. Y. The apparatus consists of one or more roasting floors, combined with a vertical main shaft running through the floors, the said shaft having a plurality of hubs, each hub provided with upwardly-projecting lips, side wings and with an overhanging flange, of a stirrer arm entered into each hub, each stirrer arm having stirrer pins or teeth, said stirrer arms also provided with an upwardly-projecting toe and with laterally-projecting pins, all arranged so that when the parts are assembled the pins will rest on the lips and the toe will enter between the flange, so that one or more of the teeth on the stirrer arms are nearer the center of the shaft than the pins and the stirrer will be in position to stir material placed upon the roasting floors.
- 556,779. GOLD SEPARATING MACHINE. John H. Shufelt, Dolores, N. Mex. The machine comprises a casing provided with legs and having a fan-box, a hopper secured to the casing, a leg hinged to the upper end of the hopper, an apron supported to the upper end of the fan-box below the discharge opening in the hopper, a removable sand box at the lower end of the fan-box, and a hinged screen across the upper end of the hopper.
- 556,985, 556,986. COAL-CUTTING OR LIKE MACHINE. Frederick Hurd, London, Eng. Patented in England August 4th, 1892, No. 14,124; in France August 8th, 1893, No. 232,025; in Belgium August 8th, 1893, No. 105,926; in Germany August 8th, 1893, No. 76,919; in Victoria November 3d, 1893, No. 10,937; in New South Wales November 6th, 1893, No. 4,715; in Tasmania November 6th, 1893, No. 1,218; in South Australia November 6th, 1893, No. 2,589; in New Zealand November 11th, 1893, No. 6,532; in Western Australia November 11th, 1893, No. 465, and in India April 9th, 1894, No. 359. Combination of a truck, a motor mounted thereon, and a spirally-grooved cutter-bar drill mounted in and rotated by a keyed rifle-grooved sleeve carried and revolved by the motor.

PERSONAL.

MESSRS. CROZE & DENGLER, consulting mining engineers, have opened offices in Denver and Cripple Creek, Colo.

MR. H. V. WINCHELL, of Minneapolis, lately connected with the Minnesota Geological Survey, and author of several articles on the iron deposits of the state, has been offered and has accepted the position of American contributing editor of the *Zeitschrift für Praktische Geologie*, of Berlin.

MR. WALTER M. CHADWICK has resigned his position as manager of the Bergenport Chemical Works of the Standard Oil Company, after a service of over 18 years, to take charge, on May 1st, as superintendent of the Pennsylvania Salt Manufacturing Company's Works, at Natrona, Pa.

MESSRS. L. C. PARKE and WILLIAM IRELAN JR., formerly State mineralogist and engineer in California, have formed a partnership to act as experts and consulting engineers for examining mining properties and advising upon metallurgical work. Their address is the Crocker Building, San Francisco.

OBITUARY.

JULIAN DURO, one of the leading iron manufacturers of Spain, died in Madrid last month.

B. W. DOYLE, secretary of the Pennsylvania Lead Company, died at Sewickley, Pa., on March 31st.

W. T. BARBEE died suddenly in the Blue Belt Mining District, Utah, on March 24th. He was one of the pioneer mining men of Utah, and was the discoverer of several well-known mines.

ORRESTES CLEVELAND, a well-known citizen of Jersey City, N. J., died at Norwich, Vt., on March 30th, aged 67 years. He was the first president of the Joseph Dixon Crucible Company on its organization in 1868.

FRANCIS R. FAVA, JR., professor of mathematics and engineering in the Columbian University, Washington, D. C., and son of Baron Fava, the Italian Ambassador to this country, died in Washington last week aged 35 years.

LEON DAGUERRE DOSPITAL died in Madrid, Spain, last month. He graduated from the Ecole Centrale de Paris as an engineer. He went to Spain where he was in the railroad service. Later he developed pyritic deposits in the province of Huélva, and became one of the founders and the vice-president of the Union Hullera y Metalurgica de Asturias, in the development of the coal mines of which company he took a leading part.

SOCIETIES AND TECHNICAL SCHOOLS.

NEW YORK MINERALOGICAL CLUB.—The annual meeting and election of officers for the year will be held on April 30th, at No. 75 West Fifty-fifth street. Plans for excursions for the season of 1896 will also be considered, and notes given of new localities in the vicinity.

AMERICAN MATHEMATICAL SOCIETY.—A regular meeting of the society will be held on April 25th, at 3 o'clock, in Hamilton Hall, Columbia College. A paper will be read by Mr. Emory McClintock, "On the most perfect forms of Magic Squares, with methods for their production."

MONTANA SOCIETY OF CIVIL ENGINEERS.—The regular monthly meeting of the society was held in Helena on March 15th. The chairman appointed James S. Keerl, F. J. Smith and C. W. Goodale as members of a committee upon what is known as the "Architects Bill," now pending in Congress.

LEHIGH UNIVERSITY.—Mr. Russell W. Davenport, of the Bethlehem Iron Works, lectured before the students of the University last week on the manufacture of armor plate as practiced at the Bethlehem Iron Works. A sixteen page pamphlet, describing the course in civil engineering, has just been issued by the University.

ENGINEERING ASSOCIATION OF THE SOUTH.—The informal meeting for March took place at Nashville, Tenn., on March 27th. The subject of good roads was a special order for the evening and was fully discussed. The regular meeting of the association will take place on April 9th. A paper by Mr. Edward Mead on "Cement Mortars" will be read.

WESTERN SOCIETY OF ENGINEERS.—The regular meeting of the society was held in Chicago, Ill., on April 1st. A paper was presented by Mr. W. T. Keating on "Coefficients in Hydraulic Formulae Determined by Measurements of Flow in the Desplaines River Diversion, Made by the Sanitary District of Chicago." The topical discussion on "Hydraulic Cements and Concretes" was continued.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—At the ordinary meeting of this society, held March 20th, a discussion took place on Mr. Dawson's paper on "Retaining Walls," which was followed by a discussion on the resolution "That engineering works should be constructed by day's work, under the immediate direction of a civil engineer instead of being done through a contractor." Mr. Cyrus Carroll's paper on "The Effects of Engineering Works on Water Currents" was then discussed.

ENGINEERS' CLUB OF CINCINNATI, O.—At the March meeting of the club 19 members and five visitors were present. Two new members were elected. Mr. George Hornung read the paper for the evening, entitled "A Review of the Various Plans Proposed for Improving the Water Supply for Cincinnati, from 1865 to 1895, and a Consideration of the Properties of the Ohio River Water as Influencing the Designing of a New Plant." He also described an apparatus which he had designed for determining the relative turbidity of water, together with a diagram illustrating the results of experiments in this line on water from the Ohio River which he had conducted several years since, and which exhibited some interesting characteristics.

CHICAGO SCHOOL OF ASSAYING.—This institution has now been opened some weeks, and is meeting with success. The course offered embraces practical instruction in assaying, chemistry, elementary and advanced metallurgy as applied to alloys, etc.; blowpipe analysis; lecture courses in dynamic and structural geology, with special references to mining requirements. Special courses in the analysis of iron and steel, fuel, etc., are also given, to meet demands of foundrymen and others interested in the metallurgy of iron. The school has three fully equipped laboratories. Students are given lessons at any hour during the day and evening. The instruction is almost entirely industrial, so that students may enter at any time. Prof. J. D. Young, a well-known assayer and chemist, is director, and is assisted by specialists in the various branches of technical instruction offered.

NEW YORK ACADEMY OF SCIENCE.—Regular meetings of the Academy will be held on Monday evenings, April 6th, 13th, 20th, and 27th, at eight o'clock, in Hamilton Hall, Columbia University. April 6th, regular business meeting, section of astronomy and physics. The following papers will be read: "The law of deflection sets under drop tests in different sections of steel rails of uniform physical properties, follows the comparative moments of inertia of the respective sections," by H. P. Dudley; "On the permanence of the Rutherford photographs," by Harold Jacoby; and remarks by J. K. Rees, on: 1. "The Harvard College Observatory photographs of star clusters, planets, variable stars and stellar spectra." 2. "Prof. J. E. Keeler's planetary spectra," illustrated by photographs and lantern slides.

On April 20th, before the section of geology and Mineralogy, the following papers will be read: "The stratigraphy of the Browns Park Beds, Utah," by J. D. Irving; "Notes of a trip through the marble quarries of western New England and eastern New York," by H. Reis, and "The origin of the talc deposits near Gouverneur, N. Y.," by C. H. Smith.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—At the regular meeting, in Allegheny, March 19th, the following applicants were elected to membership: G. A. Winslow, electrical engineer; John McGrew, P. E. Hunter, C. W. Ehlers, James R. Elliott, E. W. Cunningham, civil engineers; Ralph Crooker, Jr., engineer; H. M. Hooker, agent, R. A. Rowland, manufacturer. The evening was chiefly taken up with the reading of a paper by R. M. Atwater on "The Effect of Oven Construction on Coke." In the commencement of his theme Mr. Atwater quoted Prof. J. P. Leslie's description of the Pittsburg coal vein, and stated its small percentage of high grade coking coal. Yet this 1% of Pittsburg coal yields 75% of all the coke made in Pittsburg—over 8,000,000 tons in 1895. The available coal left in the Connellsville field is estimated to produce 70,000,000 tons of coke, which, on the basis of 1895's consumption, would not last over 10 to 12 years. Taking a broad view Mr. Atwater believes there is no controversy between the Connellsville beehive oven and the retort oven. The existing ovens will have completed their useful existence before the adjacent coal is exhausted. The new construction would take the form of the retort oven. The beehive oven, he maintains, makes no provision for the physical improvement of the coke. It is primitive and unimproved. He holds that the new construction will bring other coal territories into the coke producing field. The speaker predicted a new standard coke upon the mature development of the retort oven.

MICHIGAN MINING SCHOOL.—The Michigan Mining School includes in its curriculum a very extended course in testing materials used in engineering work, and invites our co-operation in making this work of service to the engineering world. The testing laboratory will be placed at the service of mining men generally, free of charge, on the following conditions: Practical work in testing begins Monday, June 1st, 1896, and continues five weeks. All samples of material received by that time will be tested by the students, as a part of their regular work, and a report of the test will be rendered, free of charge. Not less than three test pieces of each shape selected by you should be sent, and half a dozen would be better. As all expense of operating machinery, furnishing supplies needed for the testing, etc., will be assumed by the Mining School, it is desired that all test pieces be finished ready to go into our machines; otherwise they cannot be tested, unless the party owning them forwards funds to cover the cost of working the specimens into shape. While the school wishes to accommodate all, it cannot guarantee to shape up specimens even when funds for that purpose are sent, as the shops are usually too busy on other work to spare the tools and men for such a purpose. All transportation charges on material are to be

prepaid. The test pieces when operated upon will be considered as the property of the school, and will not be returned. Reports will be forwarded when the course is completed, and the results are worked up. Full information, with blue prints, etc., will be furnished on application to the Michigan Mining School, Houghton, Mich.

INDUSTRIAL NOTES.

Port Oram furnace at Port Oram, N. J., has gone out of blast for repairs.

The Rock Run (Ala.) Iron and Mining Company has blown in its furnace.

The Tubular Axle Company, Toledo, O., has been placed in the hand of a receiver.

The property of the Chillicothe (O.) Foundry and Machine Works will be offered for sale on April 8th.

The plant now in operation at Wheatland, Pa., for making mineral wool from blast furnace slag is to be removed to Sharon, Pa., and enlarged.

The Anniston (Ala.) Iron and Steel Company has purchased the best of the machinery of the old Elyton rolling mill, at Birmingham, and will use it in its own rolling mill.

The Star Drilling Machine Company, of Akron, O., has shipped to Rangoon, Burmah, two large drilling machines to be used in sinking wells in the oil fields recently opened there.

The Ellis & Lessig Steel and Iron Company, Pottstown, Pa., has notified its employees of a raise of wages in every department of 10%, taking effect April 1st. The company employs about 500 men.

It is reported that negotiations have been closed for the location of a steel manufacturing plant at Coraopolis, Pa. The site has been decided upon and building operations will be commenced shortly.

The steel wire nail works, Port Townsend, Wash., after being closed down for the past 18 months, have resumed work. The machinery will be operated day and night, and the output will be 800 kegs of nails daily.

The Edgar Thomson Steel Works, of Braddock, Pa., has just completed rolling a 5,000-ton order for the Pennsylvania Railroad of 60-ft. rails 100 lbs. to the yard. Some 100-lb. rails have been in use by the New York Central for some time.

The puddlers at the Ellis & Lessig Iron Works, at Pottstown, Pa., stopped work on April 1st, because of a disagreement about wages. The company advanced the wages from \$2.25 to \$2.50 per ton, but the men demanded, \$2.75. There are 20 puddling furnaces in the mill.

The Royersford, Pa., Chemical and Manufacturing Company has been organized and will engage in the manufacture of dry white lead, red lead, pipe and sheet lead and various chemicals. The company is capitalized at \$200,000. The erection of necessary buildings will begin at once.

Judge Vinje, in the Circuit Court, at West Superior, Wis., has granted an order authorizing Howard Morris, receiver of the West Superior Iron and Steel Company, to issue receiver's certificates to the amount of \$50,000 in order to save the plant, valued at \$3,000,000, from going to tax sale.

It is announced that the contract between the General Electric Company and the Westinghouse Electric and Manufacturing Company, providing for an exchange of licenses under their patents, recently authorized by the boards of directors of the two companies, was executed on April 1st, and delivered.

The Dickson Manufacturing Company, of Scranton, Pa., has elected as directors the following: Wm. Connell, W. W. Scranton, H. M. Boies, C. C. Rose, W. H. Storrs, C. S. Weston, Samuel Sloan, C. R. Manville and C. H. Zehnder. The officers are: President, C. H. Zehnder; secretary and treasurer, L. T. Bower; general manager, De Courcy May.

The Frick & Lindsay Company, Pittsburg, representatives for the John A. Roebling's Sons Company, has received the contract to furnish the wire rope for the construction of the new suspension bridges to cross the Ohio River at Rochester, Pa., and East Liverpool, O. It is said that the contract involves about 450 tons of wire rope.

The Canton Rolling Mill Company, of Canton, O., has re-elected the old directors and the following officers: President, W. W. Irwin; vice-president, D. H. Townsend; secretary, E. L. Burchfield; assistant secretary, M. F. Taylor; treasurer, R. W. Jones; manager, R. A. Wilson. The company has made many improvements, including a 50-ft. addition to the main building and two new annealing furnaces.

The Omaha & Grant Smelting and Refining Company has purchased from Horace F. Brown the entire rights for the United States of the Brown DeCamp Condensing Chamber for lead fumes from lead smeltings. In December, 1894, the Brown DeCamp Condensing Chambers were placed at the works of the Omaha & Grant Company, and so satisfactory have they worked that the right for the United States has been granted to the company.

INTERNATIONAL PACIFIC RAILWAY COMPANY.—Articles of incorporation of the International Pacific Railway Company were filed with the Kansas Secretary of State at Topeka, last week. The purpose of the organization is to construct a single or double track railway from Guaymas, on the Gulf of California, in Sonora, Mexico, northeast 115 miles, to Barraca. The road will be tributary to the mines in Sonora and Chihuahua, which it proposes to develop. The charter also provides for building a line north to the boundary line north of Mexico and the United States at Bisbee, Ariz., and on to a connection with the Atchison and Southern Pacific at or west of Deming, N. M.

The stockholders of the Spaulding & Jennings Company, steel and iron manufacturers, of Jersey City, N. J., met on March 30th and elected the following directors: Thomas H. Spaulding, Robert E. Jennings, Stephen W. Baldwin, of the Pennsylvania Steel Company; E. W. McIlvaine, of the Bethlehem Iron Company, and Benjamin Graham, of the banking firm of Cuyler, Morgan & Co. The Spaulding & Jennings Company was recently organized to succeed the firm of Spaulding & Jennings, which assigned in January last. The company has been incorporated, and has a capital stock of \$400,000. Messrs. Spaulding & Jennings, of the former firm, are members of the newly organized company. The works are now running on full time. Three hundred and fifty hands are employed.

TRADE CATALOGUES.

The Union Iron Works have sent out *Catalogue No. 3*, which is gotten up in first-class style. The general site of the Union Iron Works, at San Francisco, where so much important work is now being done under contract for the United States Government, is well illustrated. This special issue refers to mining and milling, covering the subjects of rock crushing machinery and appliances, every detail of stamp battery, and the necessary connection in regard to concentration, etc. The work is carefully elaborated, and deals with gold milling and silver milling separately. Any one who requires information on the subject of dryers, whether for the purpose of cyanidation or other process, will find valuable information. Roasting furnaces, the Boss continuous system, lixiviation and smelting are all fully attended to.

The catalogue we have received from the Hammond Manufacturing Company relating to their improved self-contained cushioned framed stamp mills is interesting to any engineer or millman on account of the evidence afforded by it that the Pacific Coast manufacturers are not going to be left in the lurch by their Eastern competitors. The prospecting two-stamp mill is remarkably handy in its design, and more efficient than most of the prospecting mills hitherto sent out on a small scale. The automatic steam stamp would meet the requirements under many conditions, and apparently is well designed, and its shipping weight, 6,000 lbs., is not so great as to render it undesirable. The rest of the catalogue gives valuable information with regard to automatic ore feeders, roller grinding pans, ore cars, and other appliances connected with mining and milling.

It is seldom that an industrial concern issues a catalogue at once so comprehensive, valuable and artistic as the 500-page book which Messrs. Charles A. Strelinger & Co., of Detroit, Mich., have published. It is really what its title denotes, namely, "A Book of Tools," and contains full descriptions and illustrations of some thousands of tools, supplies, machinery, etc., used by machinists, engineers, blacksmiths, model makers, founders, moulders, inventors and others, and in manufactories, mills, mines, etc. Messrs. Charles A. Strelinger & Co. are both manufacturers and dealers in all the articles described, and the book is not only of great value to technical men but the preface is worthy the perusal and emulation of other manufacturers as containing valuable suggestions and directions and also sound advice on what a trade catalogue should be. We especially commend it to our foreign readers. The book, bound in strong paper covers, will be sent to any address on receipt of 15c. to cover mailing expenses. It is indeed difficult to overpraise this "Book of Tools," which is now before us.

The Lidgerwood Manufacturing Company has issued a catalogue which is most instructive in regard to handling large amounts of material at the lowest possible cost—the text of the catalogue being the work done by means of their appliances on the Chicago Drainage Canal, which may be best described as traveling cableways. The illustrations in the catalogue very fully describe the method of handling both the glacial drift and the solid rock, and the comparison made between the Chicago Drainage Canal in point of dimensions and that of the celebrated Manchester Canal of England, the North Sea Canal of Germany, also that of Amsterdam, will serve for engineers to establish a standard of efficiency. These comparative cross-sections show that the Chicago Canal has a greater area than either the Suez or the other canals mentioned above. The estimated cost is also mentioned of the work under contract, but the important point is that the requirements specified by the original cableway call for a machine to handle 300 cu. yds. per day, and that it should move along the canal at 2½ to 5 ft. per day. The actual result was that

as much as 500 to 600 cu. yds. per day could be handled, and when the final improvements were introduced it is no exaggeration to say that the apparatus had a working capacity of 600 cu. yds. per 24 hours.

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.

UNITED MINE WORKERS OF AMERICA.—National Secretary Patrick McBryde has sent out the call for the annual convention of the United Mine Workers of America to be held at Columbus, O., on April 14th. The coming convention promises to be an important one in the history of the organization. The company store question will be a matter of great consideration. The action of the Pittsburg miners and operators in dispensing with the obnoxious practice has awakened the miners of other States for the importance of the question.

ALASKA.

ALASKA MEXICAN GOLD MINING COMPANY.—This company reports its clean up for the month of February, as follows: Period since last return, 29 days; bullion shipment, \$23,567; ore milled, 6,625 tons; sulphurets treated, 163 tons. The bullion produced from sulphurets amounted to \$8,563, and the working expenses for the period, \$15,789.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

AMADOR QUEEN.—At this mine two miles south of Jackson, the work of sinking has been resumed. The ore at the present depth shows up as well in gold as the mill tests of a limited quantity of ore made a few months ago.

EL DORADO COUNTY.

(From Our Special Correspondent.)

SALISBURY.—This mine, six miles south of Placerville, has been purchased by Mr. Monroe Salisbury. The property comprises 250 acres and is partly developed. The machinery includes two Huntington mills. The new owner will sink a 500-ft. shaft, erect a hoist, add milling machinery and lay a large pipe line.

LAKE COUNTY.

(From Our Special Correspondent.)

ABBOTT QUICKSILVER MINE.—This well known mine is located near the Colusa County line at the head of Grizzly Creek, 22 miles from Lower Lake, and comprises 70 acres with 760 acres of timber land. Major J. L. Rathbone, the owner, has just sold this property to A. T. Boggers, representing Eastern capitalists for \$125,000, one half cash and the balance on a mortgage on the property. It is understood that the present force of men at the mine will be retained including Superintendent A. A. Gibson.

MARIPOSA COUNTY.

MERCED GOLD MINING COMPANY.—The published report that this company has closed down is now denied. The men in one of the three shifts were laid off on account of having finished development work. The ore in that shaft is all blocked out ready to be taken out for milling. According to our exchanges, the mill is running full handed and steam is up in all the mines.

MONO COUNTY.

BULWER CONSOLIDATED MINING COMPANY.—The yield of the Bulwer Consolidated mine for the week ending March 22d was 11 tons of ore, the estimated value of which is \$25 per ton. In the Bulwer tunnel the upraise started last week has a seam of ore in the top 3 to 4 in. wide and of good grade.

STANDARD CONSOLIDATED COMPANY.—This company is putting up another cyanide plant, which will be erected down the canyon near the old Wagner mill site, says the *Bodie Miner*. It will probably be in running order by May 20th. After this is completed the Bodie Cyanide plants will have a daily capacity of about 410 tons, as follows: Standard Company, 200 tons; Southend Cyanide, 160 tons; Bodie Tunnel, 25 tons; Parr & Tyack, 25 tons. It is expected that the different plants will be started up very shortly.

NEVADA COUNTY.

MENLO MINING COMPANY.—A clean-up of 15 loads of ore from the Illinois claim, a part of this company's property which has just been made, netted \$1,596, exclusive of sulphurets. The ore came from the 400-ft. level.

POLAR STAR MINING COMPANY.—Suit will be begun at once against the Harvey Gold Mining Company, of Grass Valley, to quiet title to the ground embraced in the claim of that company, located near the North Star. The plaintiffs in the

case will be the Polar Star Mining Company, recently incorporated. The Polar Star claims to have a title to the Harvey ground. The directors of the Polar Star Company are: M. F. Tarpey, W. B. Carr, W. W. Foote, W. W. Byrne, A. Byrne.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

CHRISTIE AND COUPON.—These mines, 50 miles east of Victor, just west of the Rose mine, have been bonded by the Morongo Mining and Milling Company of Riverside for \$30,000.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

NEBRASKA.—This mine is located on Cherry Creek. A five-stamp mill is being put in. The ledge is from 1½ to 3 ft. wide. Last year only 200 tons of ore were crushed, which run from \$10 to \$20 per ton.

TUOLUMNE COUNTY.

BLACK OAKS.—This group of 5 mining claims has been sold to an Eastern syndicate. The former owners have been working with a 20-stamp mill, and the mineral is said to run \$50 to the ton. Of the other four locations the White Oak and the Live Oak show good indications.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

BALD MOUNTAIN.—This tunnel has been driven 350 ft. and an upraise is now being driven to catch the ore chute. The vein is several feet wide, and a large body of fine shipping ore is in sight.

BEGGAR.—A patent was recently applied for on the Beggar, but the counsel has just been denied the application owing to a defect in the publication. The property is now under litigation in the district court in Boulder.

BUENA.—Mr. J. Bergheim has purchased from Paul Gebhard the latter's interest in the Buena mine, and will begin development on a large scale shortly.

COLUMBUS.—A strike of gold ore is reported at a comparatively shallow depth. Extensive developments will be commenced at once.

CORA.—Developments will be very extensive this spring. Manager J. A. Gillfillan has just returned from New York City, where he purchased a large electric power plant and other necessary equipments, which will arrive about April 1st. The Cora is in excellent ore and promises to be a regular producer.

GEORGE.—Until this week the George lode was a prospect, but now has 16 in. of gold ore which also carries some silver.

GOLD KING.—This property was sold this week by George Hemler to J. P. Olympus, of Denver, the purchase price being \$2,000. Mr. Olympus expects to put in an adequate force and machinery at once.

IRONSIDES.—A vein 3 ft. wide has been uncovered, which assays quite well in gold.

MEADOW LARK.—Wood & Wessel have, it is reported, struck 18 in. of rich gold ore and a large vein of good milling dirt in the breast of the tunnel, and shipments will begin immediately.

MINER'S HOPE.—Thomas Wiederhold has secured a lease and has a small force of men clearing out and repairing the old workings.

NELLIE BLY.—This company has decided to put in a bromine mill this spring, as the most feasible method of treating the vast quantities of low-grade ores found in that property.

NEWMARKET.—Dr. J. Campbell and Mr. Cline secured a lease on this property a short time ago, and recent developments have shown up some rich ore in the shaft. The vein has widened during the present week. The mine is managed by Col. Ivers Phillips and is owned by the Ames estate, of Boston.

ROUTT.—A large force is employed and the indications are good. Some ore has already been taken out and is stored for shipping. The owner, John D. Mason, is pushing operations.

SMOKY HILL.—Myers Brothers have made a trial shipment, which has returned good results. Development will be carried on during the summer.

TRILBY.—Ore was struck at a depth of 10 ft. running well in both gold and silver. The Trilby is situated in the Hog Back district and is owned by Wells Bros. & Co.

WIRTH.—An option has been given to Frank Canfield and negotiations are pending for a sale. The Wirth is considered a promising claim.

CLEAR CREEK COUNTY.

MIC-MAC.—All of the miners employed upon the Mic-Mac mine at Empire, about 38 in number, quit work last week and attachment papers were issued against the machinery, ores, etc., at the mine. The Georgetown *Courier* states that the company, which is a Denver concern, is behind with the men about \$2,200 and has issued several hundred dollars in checks to the miners which are said to be worthless.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

CLIMAX.—This property recently shipped a car lot to the Argo Smelter which sampled 3.22 oz. of gold and two cars to the Florence Cyanide Works sampled 1.87 oz. The shaft is 170 ft. deep, and the vein is from 2 to 7 ft. wide, but at present is broken up. The pay-streak jumps from side to side, and at

present for 2½ ft. wide assays over 7 oz. There are on the dump 250 tons of a medium grade ore of from 3 to 5 oz. The property is doing well, and will if the owners wish materially help the output of the camp this year.

ELKTON MINING COMPANY.—The Elkton shipped a car load of ore recently which is estimated to yield over \$20,000. A little more care than usual was exercised in the sorting of it. The water in the shaft is again safely under control.

LONDONDERRY.—This property, adjoining the Climax, has sunk a shaft 200 ft. deep and from the bottom of the shaft crosscuts have been extended in all directions. Occasionally, small pockets of ore have been met with, the last being about 1,500 lbs. of \$800 ore. The owners seem sanguine that there are large pockets on the claim, and are prosecuting development to find them.

MOOSE.—The south shaft is now down 200 ft. and three shifts of men are constantly employed, it being the intention to make this the main shaft for working purposes. The old shaft is not being sunk on account of the water which is too much for the bucket. The development from this shaft is being pushed vigorously by means of compressed air rock-drills.

PEOPLES MINING AND MILLING COMPANY.—The Bogart on Raven Hill, owned and worked by this company of Denver, has sunk a shaft 270 ft. deep and is now cross-cutting to the west in search of a good vein.

PHARMACIST MINING COMPANY.—The shaft has been sunk 650 ft. and the present showing is good. The pay-streak in the shaft is fully 3 ft. wide assays taken across yielding \$690, but the smelters' returns give over \$100. This property for 2½ years did not meet expenses, but incurred a debt of over \$8,000, which is fast being liquidated. The shaft was sunk 330 ft. on the vein without encountering any mineral of value, the assays yielding from \$3 to \$5 per ton, and yet at the depth of 620 ft. the values in the vein returned and the property in all probability after the erection of heavier machinery will be in a position to resume dividends. The Pharmacist is now the second deepest shaft in the district.

RAVEN.—This mine ships about one car per day of ore which averages from \$61 to \$65 per ton. The property generally shows well.

SHERIFF.—This property adjoining the Bogart has several sets of lessees at work. All of whom are piling up mineral for shipment or milling. Mr. Jackson took out 85 tons at the 30-ft. level which sampled \$15 per ton.

GILPIN COUNTY.

(From Our Special Correspondent.)

AMERICUS.—A good body of ore has just been struck in the shaft here, a trial lot of which yielded at the mill 3½ oz. of gold per ton.

BAXTER & CRISPIN.—Parties from Golden have taken a lease and bond on this claim in Spring Gulch, from Messrs. McFarlane, and will commence work in a few days. The Baxter is an old patent and is well thought of locally.

GETTYSBURG.—Indiana parties have commenced work at this mine, and are now clearing the shaft so as to hoist water. The levels are all caved, so that the width and value of the vein cannot be seen, but it is said to have averaged 2 ft. wide, the mill dirt running from 2 to 4 oz. per cord. The shaft is about 550 ft. deep.

GOOD LUCK.—This claim, situated east of the Gladstone, at Lakeview, has been purchased for \$2,000 by the West Fisk Mining Company of Boston, operating the Jasper mine near by.

GREGORY-BOBTAIL.—The pumping machinery of the Gregory Bobtail mines which had been submerged at about 650 ft., for some time past, has been reached. Mr. Gilmore, the superintendent estimates that about 1,000 gallons per minute will be lifted with the old pumps, which will drain the water from the Fisk mine in about six weeks, so that development work on the property can be resumed and it is the intention to then put a large force on the Fisk property. On the upper levels about 40 men are at present employed and at the Polar Star and Bobtail mills, 45 stamps are working on the ore produced. Several other properties on this large vein will also thus be drained.

HILLHOUSE-COLUMBUS.—These adjoining claims, in Russell District, have been taken up on lease and bond by W. Williams and other local men. No work has been done as yet on the Hillhouse; the Columbus is however, raising some good-looking ore from a small shaft worked by a whim. The Hillhouse is a large and masterly vein, heavily mineralized, the Columbus being its extension to the east. Both are promising claims, worthy of vigorous exploration.

NIAGARA.—Rapid progress has been made with the new shafthouses and hoisting plant at this mine. The small steam hoist at the upper shaft is already at work, while the larger plant at the lower shaft will be ready to commence hoisting water next week.

RIVAL.—This claim, with the East Rival adjoining, both on Bobtail Hill, are reported to have been sold to a Chicago company for \$10,000.

LAKE COUNTY.

(From Our Special Correspondent.)

A NEW TERRITORY.—Preparations are being made for increased activity in the section of the camp south of Iowa gulch. The new strikes made in this territory during the winter has created a

fever of excitement among local prospectors, and that new country will be thoroughly developed this spring.

DOUSER.—On this property, located on Weston Pass, a new shaft is being sunk. This is down 50 ft., and at a further depth of 50 ft. the ore contact should be encountered. This shaft was begun on the strength of a piece of gold which assayed well in gold. The entire country of that section is staked off, and next month will see a great deal of new work inaugurated.

KENO SHAFT.—This shaft so badly damaged by fire last year is being retimbered, and preparations are being made to conduct active development work. The shaft is well located in the Rock Hill section, and is down 500 ft.

LEADVILLE MINE LEASING COMPANY.—This company is actively developing the Sixth street shaft, and is shipping daily 75 tons of manganese, and 25 tons of the higher grade ore.

MONARCH MINING COMPANY.—Preparations have been completed to push down the new shaft already started on the Virginus claim. Chicago people are interested in this consolidation.

MORNING AND EVENING STARS.—Iron shipments have been resumed, and the output is 100 tons a day of good iron ore from the two properties.

ORE OUTPUT.—The shipment of manganiferous iron to the Illinois Steel Works and the heavy product of iron for the local and valley smelters has largely increased the output for March, which is estimated at 45,000 tons.

RIALTO MINING AND LEASING COMPANY.—Articles of incorporation and of full paid stock, \$500,000, were filed this week. The incorporators are H. C. and J. B. Mitchell, N. M. Estey, Albert Koberle and R. B. Estey.

ROBERT E. LEE MINING AND LEASING COMPANY.—Articles of incorporation just filed give the capital stock at \$200,000, shares \$1 each. The incorporators are Edwin Shaw, B. Canon, J. C. Nicola, J. H. Ramsay, A. R. Wells, D. T. Clark and C. R. Holland.

WOLFTONE.—But little new work is being done, and the mine is only shipping about 40 tons daily of medium grade sulphides.

PITKIN COUNTY.

FRANKLIN MINING COMPANY.—This company has it is said made some kind of a deal with the Cowenhoven tunnel people and on March 24th deeds transferring the property on Aspen mountain to the tunnel company were filed with the county clerk.

IDAHO.

OWYHEE COUNTY.

BANNER.—Messrs. Grete, Leonard & Farmer have just finished their assessment work for this year upon the Banner claim in Coffee gulch. They had the labor performed in the Webster tunnel, being run to cut their ledge, and have cut one large vein about 50 ft. east of the Banner. This ledge shows from 7 to 10 ft. of solid quartz, but is mostly barren. The owners intend running the cross-cut to the Banner this season.

POORMAN.—A new contract has been let on this property. The development work being performed at the mine is all done by contract. It will probably be a month yet before the company begins extensive operations, at which time an electric plant will be put in to furnish power for hoists, etc.

ROARING GIMLET.—Miller & Anderson, owners of this claim, in Slaughter House Gulch, have 2 ft. of quartz in the face of their tunnel.

TIP TOP.—The contractors who are running the cross-cut to tap the Tip Top ledge, are making good headway. The tunnel will cut the ledge at the bottom of the 300-ft. shaft.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

BLACK HILLS LEAD AND ZINC COMPANY.—This company has a lease on 20 acres southwest of Galena, and has several shafts that are producing both lead and zinc ore. The company has been incorporated with a capital stock of \$100,000.

COOLEY MINING AND SMELTING COMPANY.—The Ohio Lead and Zinc Company, has been incorporated under the name of the Cooley Mining and Smelting Company, capital stock \$250,000. This company owns 40 acres in the southeastern part of Galena, Kan., and has several large producing shafts on the lease.

GALENA MINING EXCHANGE.—A mining exchange has been organized and is now in full operation.

KEYSTONE.—At this mine on the North Empire lease, the owners made a rich strike, and are drifting at 80 ft. on a rich run of lead and zinc ore in open ground. Last week they made their first turn-in of 23,400 lbs. of zinc and 9,880 lbs. of lead ore.

MAE S.—This mine is located on the North Empire lease, and is one of the largest producers on the lease. They are drifting at 75 ft. on a 20-ft. face of ore in open ground. This shaft is 90 ft. deep, and has rich pay dirt from 50 ft. down, and good ore on each side and in the bottom of the drift. Last week they concentrated 140,680 lbs. of zinc ore and 17,450 lbs. of lead. A \$10,000 offer has been refused for this mine.

OLD COON.—On the North Empire lease is located this mine, which turned in last week 53,640 lbs. of

zinc ore, and 3,500 lbs. of lead. They are drifting at 75 ft. on a large face of lead and jack dirt in open ground and no water. They will build a concentrating plant as soon as they develop the ground, as they are producing a large amount of crusher ore which has to be hauled about a mile to be crushed and then cleaned in hand jigs.

MICHIGAN.

COPPER.

TAMARACK MINING COMPANY.—A press despatch from Houghton says that, owing to a break in the compressor house of the Tamarack mine, about half of the miners are not working. The damage will be repaired as soon as a main shaft arrives from Milwaukee, and the mines will be running full-handed within a week.

MINNESOTA.

(From Our Special Correspondent.)

LABOR TROUBLES.—The Trades and Labor Assembly, of Duluth, has caused the arrest of Captain Bale, of the Minnesota's mines at Tower, for discharging an employee for connection with a labor union, that being an offense under the State laws. The mining company had posted notices that men belonging to the new Miners Progressive Union must look for work elsewhere, and two men were actually discharged. Hence the trouble. It is feared by mining men that there will be considerable difficulty with this organization before the summer is over and they are trying to prepare for it in advance. The union has grown very rapidly.

COOK COUNTY.

(From Our Special Correspondent.)

Rumors are again astir to the effect that a railroad is to be built to the iron deposits of the Cook County fields, to the northwest of Duluth, near the shores of Lake Superior. It is also claimed that the nickel deposits there are to be exploited soon, but there is no evidence that the reports are more authentic than customary.

IRON—MESABI RANGE.

(From our Special Correspondent.)

ADAMS MINING COMPANY.—This company has sunk its No. 2 shaft 150 ft., a good share of the distance in excellent ore, and has installed a machinery plant at the shaft. The plant consists of double 6-ft. drums, carrying two 3-ton skips, hung in balance, and driven by horizontal engines. A small stock pile has already been made at the shaft. The company is still stripping at the other part of its mine, and will be a very large shipper, though the action of the pool in cutting down the allotment may have some effect in keeping it down.

DUNN IRON MINING COMPANY.—This company, which last week started exploratory operations on the eastern range, near McKinley, has stopped for the present. No explanation for the suspension is given.

OHIO MINING COMPANY.—This company has made arrangements with the Drake-Stratton Company for mining what ore is to come from its property at Virginia this year. The mine has been given a very liberal allotment in the Bessemer pool and will be a large factor in the business of the range.

OLIVER MINING COMPANY.—Work at this property, in anticipation of its extensive mining operations for the season, at least 600,000 tons, has begun cleaning up about the Lone Jack and Oliver mine. Shipping will begin in about two weeks.

SNYDER EXPLORATIONS.—Capt. Mallman has four drill holes down in ore in a length of 1,200 ft. in section 13, 56-24, for Samuel P. Snyder, and has found good ore and apparently a very large body. Further work will be carried forward at once to test the find.

T. B. WALKER EXPLORATIONS.—On property belonging to Mr. Walker, extensive search for ore will be carried on this summer, and work is to be started at once by J. J. Kline. The probabilities are that ore will be found.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

NEW OPTIONS.—Several working options have been given lately on the Vermilion range, among them two by C. P. Macginnis and others to S. S. Smith. They are on 160 acres in section 3, 62-13, and on 60 acres in sections 6 and 7, 62-13. The options cover purchases at \$100,000 for the first piece, and a lesser sum for the second, or leases at 20c. a ton. The prospects are considered excellent for showing large bodies of ore there. Other explorations are to be carried on east of the Chandler location as soon as the snow will permit.

PIONEER IRON COMPANY.—At this mine there are about 70,000 tons of ore in stock, and hoisting is going at the rate of 600 tons a day. The new hoisting plant will be in readiness next week, and a larger force will probably then be employed.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—There was a larger output from the mines for the week ending March 28th, as the weather was good. The price of zinc ore and lead ore was about the same as the week before with the exception of the lower grades of zinc ore which was about \$1 per ton more. The top price paid for zinc ore was \$23 per ton, with an average of a little more than \$21 per ton. There was left over unsold about 700 tons of zinc ore. Lead ore sold at \$16.75

per 1,000 lbs., with 50c. added for hauling. The turn-in from the different camps was as follows: Joplin zinc, 1,172,770 lbs.; lead, 259,700 lbs.; value, \$17,480; Webb City zinc, 1,065,410 lbs.; lead, 47,700 lbs.; value, \$11,385; Carterville zinc, 1,550,410 lbs.; lead, 344,660 lbs.; value, \$24,207; Oranogo lead, 15,890 lbs.; value \$216; Stott City zinc, 93,410 lbs.; value, \$976; Galena, Kan., zinc, 2,090,000 lbs.; lead, 450,000 lbs.; value, \$26,010; Zincite zinc, 110,930 lbs.; value, \$1,109; Aurora zinc, 540,000 lbs.; lead, 55,000 lbs.; value, \$5,376. District totals: Zinc, 6,562,930 lbs.; lead, 1,172,950 lbs.; value, \$86,762.

HARRISON & Co.—On the Empire land at Blendsville, Harrison & Co. have opened up a good prospect at 20 ft. in open ground. Last week they cleaned and sold 28,400 lbs. of zinc ore and over 5,000 lbs. of lead, with only two men working in the ground. They had pay dirt from grass roots down as far as they have gone, and still richer dirt in the bottom of the shaft.

VICTOR MINING COMPANY.—Last October the concentrating and pumping plant of this company, on the Connor land, about a mile southeast of Webb City, was burned down, and the company has rebuilt a large double plant that cost \$8,000. The plant is equipped with two 80 H. P. boilers, a 150-H. P. engine, two 16-in. crushers, 4 sets of rolls, two roughers and two cleaners. The company is drifting at 197 ft. on a 40x60-ft. face of zinc ore in open ground. It also has a rich face of zinc dirt at 220 ft. This mine and plant sold for \$100,000 only four years ago, and has always been a large producer. The property belongs to a number of Ohio capitalists, and has 10 acres of ground to work.

MONTANA.

DEER LODGE COUNTY.

(From Our Special Correspondent.)

ONTARIO.—Mr. J. Frank Longmaid, one of the owners of the Penobscot mine at Marysville, has identified himself with the Ontario mine as the superintendent and general manager. One consideration of his doing so was the purchase of a large block of stock, 60,000 shares.

LEWIS AND CLARK COUNTY.

ONTARIO.—This mine located about 10 miles from Rimini, is running with a full force, both in the mine and mill. This property is one of the oldest mines in the district. The concentrator is being enlarged to about double its present capacity, and it is expected that everything will be in readiness for operation before April 15th. A water elevator is being constructed. The plant of the Ontario, like the mine, is located almost on top of the main divide of the Rocky Mountains.

SILVER BOW COUNTY.

BUTTE & BOSTON MINING COMPANY.—It is reported from Boston that more than a majority of the Butte & Boston first mortgage bonds have been deposited under the call of the reorganization committee, practically all of the consolidated 7s and a majority of the stock, outside of the holdings of the Davis estate. The holders of the company's indebtedness have also given notice of their co-operation, but the committee, in order to avoid contingencies, have asked for judgments instead of claims, and these will be deposited as soon as obtained.

HEINZE PROPERTIES.—F. Aug. Heinze has conveyed to his brother, Arthur P. Heinze, about all his mining and smelting interests in Butte, or all that stood in his name, says the *Anaconda Standard*. Two deeds in the transfer were filed with the county clerk and recorder last week, the consideration named aggregating \$500,000. One deed conveys the Liquidator concentrator, the property, including the claim, concentrator, machinery, tools, etc., for \$200,000. The other deed is for the Rarus mine, the Johnstown and Pennsylvania lode claims, together with all improvements, machinery, etc., for \$300,000. It is stated that Mr. Heinze may devote his entire time to his extensive interests in the Trail Creek country, and for that reason is disposing of his interests in Butte. This transfer, it is said, does not include Mr. Heinze's interest in the Montana Ore Purchasing Company of which he is president.

MISSOULA COUNTY.

HUMBOLDT.—R. L. Hornbrook and Charles Ellingwood are sinking about 2 ft. a day on this mine, adjoining the Germana, in little Missoula gulch. The shaft is down 125 ft., and the sinking is through a ledge of good silver-gold ore which is paying the daily expenses of all operations. This property is surrounded by several like propositions that are at the present time producing pay mineral.

NEW JERSEY.

MORRIS COUNTY.

HURD MINING COMPANY.—This company, which has operated the Hurd Iron Mine at Hurdtown since the lease to the Glendon Iron Company expired, has decided to abandon the lower part of the mine. It has been worked for a distance of 5,500 ft. from the surface, following the slope of the vein, which is about 25°, and the further extension will hardly be profitable. The company will now work upward, gradually taking out the sides and pillars, and will continue to employ a considerable force. The Hurd ore is in good demand, as it makes an iron well adapted for the open-hearth steel process.

MT. PLEASANT IRON MINE.—At this mine, says the *Dover Iron Era*, it has been decided to abandon the use of the water power on account of its uncertainty and to run the air-compressor from the 450 H. P. engine, which is now in use for other purposes,

but has a surplus of power which can be applied. This will enable the company to add six more drills, which are needed in developing the new discoveries. A large number of miners are now employed in the old mine, and work is going on steadily throughout. Recently a contract has been let for a drift 9x7 ft. and about 600 ft. long, to a large body of ore existing to the west of the present mine shaft. This is being pushed as fast as possible and they expect to drive about 50 ft. per week until its completion.

NORTH CAROLINA.

GRANVILLE COUNTY.

(From Our Special Correspondent.)

Dr. R. M. Eames of Salisbury reports the receipt of some very rich auriferous quartz from this county. It is proposed to ship several tons for test on the mill under his charge.

LINCOLN COUNTY.

(From Our Special Correspondent.)

FLORENCE KNIGHT.—At this mine, under the management of J. S. Knight, operations will commence shortly. The indications are encouraging.

ROWAN COUNTY.

(From Our Special Correspondent.)

GRAFT MINE.—Ore is being hauled in small quantities from this mine to Gold Hill where it is being milled.

REIMER MINE.—Parties are prospecting and investigating at this mine for New York capitalists, who, it is reported, will purchase if satisfactory. Mr. Lee S. Overman of Salisbury, N. C., has the matter in charge.

STANLY COUNTY.

(From Our Special Correspondent.)

CRAWFORD MINE.—H. C. Berlin, late of New York, now vice-president of the Gold Coin Mines of Gilpin County, Colo., has been down looking after his interest in this county where he is engaged in hydraulic mining.

PENNSYLVANIA.

ANTHRACITE COAL.

BUCK MOUNTAIN.—Thirty-two sets of timbers caved in at No. 1 colliery at Buck Mountain, on March 30. The colliery will be idle for a week, and the accident will throw between 300 and 400 men and boys out of employment.

EAST SUGAR LOAF COAL COMPANY.—The amicable action between the East Sugar Loaf Coal Company and Elisha P. Wilber, Robert P. Linderman and C. W. Anthony, executors of the estate of Garrett B. Linderman, deceased, and Charles O. Skeer was decided at Philadelphia last week by Judge Thayer. The coal company succeeded to the owners of coal land in Luzerne County which was held by the defendants under a lease which expired December 13th, 1895. There was an agreement between the original owners and the lessees that at the termination of the term the lessors should have the privilege of taking such engines, railroads, etc., and improvements erected or made upon the premises by the lessees, at a fair valuation, to be ascertained by three men to be chosen, one by each of the parties, the two to choose a third, provided the lessees should not conclude to take a new lease on the premises. The lease having expired and the lessees having remained in possession for a month or so thereafter, pending negotiations for a renewal of the lease, which negotiations failed, the coal company notified the defendants that they would be treated as trespassers upon the land and rights of the company from the date of the expiration of the lease and not to remove any of the engines, railroads, etc. The right to do this and other questions involved were presented to the court in a case stated and three points were raised: First, were the defendants entitled to a reasonable time after the expiration of the term to remove the improvements, etc. 2d. If so, was the plaintiff entitled to an appraisal thereof before making its election to take the same? 3d. If the defendants had the right to remove the improvements, etc., within a reasonable time after the expiration of the lease, was the plaintiff entitled to take a part without being obliged to take all? The first point raised was decided in favor of the defendants. The second point was decided in favor of the plaintiff. The third point was decided in favor of the defendants and against the plaintiff.

JOHNSON COAL COMPANY.—Johnson Breaker, No. 1, at Priceburg, was destroyed by fire on March 29th. The loss is said to be nearly \$100,000, and up to this time it has been found impossible to ascertain the cause of the origin of the fire. The breaker was purchased last September from John Jermyn by the Johnson Coal Company. It was only used for a few weeks, after that the coal taken beneath it from the shaft was sent to another breaker owned by the company.

MINERAL RAILROAD AND MINING COMPANY.—This company, a corporation controlled by the Pennsylvania Railroad, which operates a number of anthracite coal mines in the Shamokin region, is about to abandon the Cameron mine, one of the largest in that region. The reason for this step is that the coal has reached such a depth that mining is no longer profitable. The action of the company relative to this mine has given rise to the story that the Pennsylvania Railroad was about to dispose of its collieries in order to devote itself exclusively to the carrying trade.

MT. LOOKOUT.—According to the *Pittston Item*, the second shaft at Mt. Lookout has been sunk to the red ash vein, the upper bench of which was struck last week at a depth of 590 ft. The vein at that point is in two parts with about 30 ft. of rock intervening. The upper seam is about 5½ ft. thick, and the lower about 7 ft. Both will be worked at the same time. As soon as the second shaft is completed the work of sinking the main shaft to the red ash vein will be commenced. The contract has already been awarded to John Lloyd, who is sinking the second shaft. The pockets to the new breaker are now up, and the work will be pushed as rapidly as possible. It is expected that the work will be completed by June.

PENNSYLVANIA & READING COAL AND IRON COMPANY.—The machinery has just been taken out of the Girard colliery, east of Girardville which has been operated by this company for the past 20 years, the breaker is to be torn down and the slope filled up with culm run from Bear Ridge colliery. This company will also sink a shaft at William Penn colliery.

RANSOM TOWNSHIP.—The trial of an ejectment suit involving coal and land valued at \$50,000 was begun at Scranton on April 1st before Judge Gunster. The plaintiff is J. M. Everhart, of Scranton, and the defendants George F. Nesbit and G. Mortimer Lewis. The land in dispute consists of 30 acres, and is situated in Ransom Township, near Austin Heights. In 1884 it was wild land, and the original owners had been negligent in paying the taxes. On June 9, 1884, the land was sold by the County Treasurer for unpaid taxes. It was bought in by Mr. Everhart for about \$15. Mr. Everhart held the land till 1892, paying the taxes each year. The land, when Mr. Everhart bought it, was not worth a great deal more than he paid for it, for it was wild land. Since then it was discovered that there is coal on the land, and it is now worth from \$30,000 to \$50,000. In the meantime Messrs. Nesbit & Lewis had acquired title to the land from the original owner, and they at once served notice on Mr. Everhart under a comparatively recent act of Assembly requiring Mr. Everhart to bring suit of ejectment against them or show cause why he should not. The defendants deny the sufficiency of Mr. Everhart's title, as they claim there was no cause for such a treasurer's sale as the taxes were paid before the day of the sale.

ROYAL OAK.—The capacity of the Royal Oak Mine will be doubled within the next two months as the Philadelphia & Reading Coal and Iron Company closed a deal on March 30th by which it will purchase the entire production of this colliery in the future. When the improvements are completed 100 additional men and boys will be given employment.

SUGAR NOTCH COLLIERY.—A terrific explosion of gas took place in the No. 9 shaft of the Lehigh & Wilkes-Barre Coal Company, at Sugar Notch, on April 1st, killing 2 persons and wounding 5 more. The accident was in a new section of the mine, in which a gangway is being driven, and as the place is exceedingly gaseous great care was taken by the men.

BITUMINOUS COAL.

A press despatch from Greensburg states that one of the largest coal land deals on record has been consummated by A. B. Copeland, of Parnassus. He represents a syndicate of Pittsburgh capitalists and has secured 12,000 acres of coal land in Westmoreland and Allegheny counties. Work will begin within a few weeks. Two shafts are now being sunk on the property.

FINLEYVILLE.—At the Finleyville mine of Henry Floersheim, 250 men have struck for 70c. a ton. He refuses to pay the rate until other operators also pay it. There will be an operators' meeting at once which will attempt to straighten out matters in the district.

FOURTH POOL MINES.—In a short time the Fourth Pool on the Monongahela will be machine-worked altogether says the *Connellsville Courier*. The following Fourth Pool mines are already working with machines: Tremont, Vesta No. 1, Fayette City mines, Little Redstone, Anchor, Eclipse and Leonard. Johnson Bros. will have electric machines for mining and a motor for hauling. This company recently purchased 2,000 acres of coal from Brown & McKee, and are working night and day, opening up the mines. They ship the coal via Pittsburg & Lake Erie Railroad.

LAWRENCE COUNTY.

CARBON LIMESTONE COMPANY.—This company, composed of New Castle and Youngstown capitalists, is about to lease and operate a large quarry near Williamsburg, Pa. A charter has been applied for by J. Norman Martin, solicitor for the company, and the charter members are as follows: C. M. Crooks, James G. Shaw, C. H. Connel, Fred Kincaid, J. G. Butler, Jr., H. H. Stambaugh and J. Norman Martin. The capital stock of the company is \$300,000, and it intends to open three quarries and employ from 200 to 300 men. Most of the stone will be shipped over the Pennsylvania Railroad and the Carnegie Steel Company will be the chief consumers of the product. The new company will be almost identical in its control with the company which is now operating extensive quarries near Carbon, in Lawrence County.

SOUTH DAKOTA.

LAWRENCE COUNTY.

FLORENCE.—Messrs. Waite & Gibbs have disposed of their interest in the Florence group of mines to

the Golden Reward Mining Company for \$30,000, and with their interest goes the control of the stocks says the *Deadwood Pioneer*. The group is practically undeveloped, very little work having been done upon it, but that has been of an encouraging nature. There are seven claims in the group, situated in the Ruby Basin district, lying just west of the Fannie and the Golden Reward, while on the north and west it is adjoined by producing mines owned in part by the Golden Reward company.

UTAH.

JUAB COUNTY.

BULLION BECK AND CHAMPION MINING COMPANY.—It is reported that a new strike has been made in hitherto unexplored ground off the 700-ft. level. Its extent has not yet been determined. The ore runs well in silver and lead. The company has purchased the Progress and Good Luck millsites in Homansville canyon from John Beck and W. H. Moeller. These springs are said to have a good flow of water.

MILLARD COUNTY.

PUMICE STONE DEPOSITS.—Mr. William Quigley, who, with his associates, has built a plant at Chicago for handling Utah pumice stone, has closed a contract for the entire output of the deposits in Millard County for the next year. The plant in Chicago has a capacity for handling from 10,000 to 12,000 tons of stone a year.

TOOELE COUNTY.

GOLDEN GATE.—According to the *Salt Lake Tribune*, manager Cohen has been surveying the ground for the new mill for the ores of the Golden Gate. The contract will be awarded within a few days, and active construction be commenced at once, with a view of getting the mill in operation by June 1st.

GOLDEN GATE EXTENSION GOLD MINING COMPANY.—This recently incorporated company is capitalized at 400,000 shares of a par value of \$5 each. The officers and directors are as follows: J. R. Walker, Jr., president and treasurer; George Kisslingbury, vice-president; C. H. Griffin, secretary. C. A. Walker and George H. Robinson, and these, with W. T. McFarlane, foreman of the Golden Gate mine, and R. H. Carr, who is also identified with the Golden Gate, comprise the incorporators of the company.

The ground owned by the company is composed of the Gold Ring, Abe Lincoln, Strong Fraction and Abe Lincoln No. 2, mining claims, comprising 63 acres of ground, which is practically surrounded on three sides by Captain De Lamar's Golden Gate holdings, and which also adjoin the Cannon Gold Mining Company's group of claims, which was recently sold for \$300,000. The ground owned by the Golden Gate Extension Gold Mining Company is squarely on the great Mercur ore zone and on the strike of the Golden Gate vein, and the drifts in the latter property have been driven to the side line of the Extension group, where the richest ore bodies have been discovered. The new company will develop its property by means of a double compartment shaft.

VIRGINIA.

BUCKINGHAM COUNTY.

MAGNETIC AND SPECULAR IRON ORE COMPANY.—This company has been incorporated by William S. Morrow, of Westfield; Henry S. Vanderbilt, of New York, and Henry A. Cousins, of Belleville. The capital of the company is \$100,000. The mining will be carried on in Buckingham County.

WISCONSIN.

MUNDIC MINING.—Mr. R. Kennedy, of Highland, Judge Chas. W. McIlhonn, of Mineral Point, and Ira J. La Motte, and G. Raymond Frost, of Chicago, formed a partnership to buy sulphur ore, or mundic, says the *Highland Press*. The new company has been active for some weeks past, and has leased 6,000 acres of mining land in Southwest Wisconsin, comprising the towns of Montfort, Livingston, and Cuba City, in Grant County, Linden and Highland in Iowa County, and Benton in Lafayette County. Mr. Kennedy has been appointed general manager, and representative in Wisconsin.

WYOMING.

BIG HORN COUNTY.

BONANZA OIL DISTRICT.—This district lies in the Big Horn basin. The product is largely illuminating oil, said to be 45% kerosene. No wells have been drilled as yet for the same reason that nothing has been done with the Lander oil—distance to transportation lines. Oil can be gathered by the barrel in natural springs near the town of Bonanza.

FOREIGN MINING NEWS.

CANADA.

ONTARIO.

(From Our Special Correspondent.)

AUSTRALIAN CLAIMS.—W. E. Stone & Sons, of Connecticut, late of Australia, are operating upon HP 140, and HP 141, with marked success, gold quartz of a good average having been exposed in some places upon these two claims of 40 acres each. The Sweder claim is adjacent to the Australian. Work in this primitive stamp mill closed temporarily pending the arrival of a Huntington mill. These claims like Bulls, are situated well with in the green slates, and schists, peculiar to the Bad Vermilion and upper La Seine sections. These veins, chiefly

bedded and parallel, have a general easterly strike carry considerable free gold visible to the eye and wherever tested give promise of permanency.

BULL CLAIMS.—The Ontario Government have at length granted titles to those well known gold claims, including Jo 13, 14, 15 and 669P. Arrangements are in progress to bond the above to Americans under developing conditions similar to Foley, Ferguson, and others, now operating here.

FERGUSON CAMP.—Since the arrival of Mr. Ferguson from England great activity prevails at the camp and landing place of Mine Centre. Arrangements are now complete to continue sinking on the Finn lode from the first level to a depth of 300 ft. The other shallow shafts are also being put under contract. Mr. Ferguson is accompanied by a party of capitalists and some employees.

PROPOSED EXPLORATION.—A prospecting expedition has been organized in New York for special work in connection with gold mining upon the upper tributaries of La Seine where as already announced in the *Journal*, some interesting discoveries of the precious metals were made last fall.

KAY-FOLEY MINE.—Vigorous development has been carried on here lately. They have four Ingersoll rock drills at work in the drifts and shaft, the latter is now down 200 ft. The vein is a pronounced fissure, almost vertical. It averages about 4 ft. and has a strike of north 20° west, showing in every opening so far free milling ore, in which native gold is distinctly visible. The Ingersoll drills give entire satisfaction.

MEXICO.

CHIHUAHUA.

BATOPILAS MINING COMPANY.—The annual report of this company for 1895 shows as follows: Product of ores reduced, \$711,586; profit discount, Hacienda currency, \$18,004; profit sales at mine stores, \$8,297; total, \$737,888. Expenditures: Mining and exploration, \$163,905; reduction works, \$118,701; mine betterments, \$228,661; construction, \$86,914; Porfirio Diaz tunnel, \$30,278; interest and New York office expenses, \$45,362; total, \$683,837; surplus, \$54,061. President George W. Quintard says: The yield for 1895, while in excess of 1894 by \$139,433, is less than expected. The total production of the mines operated by this company to January, 1896, has been \$8,789,578, while the amount expended in construction, permanent betterments and real estate is about \$5,000,000. Arrangements are in progress to drive the Porfirio Diaz tunnel with enlarged compressors and drills, an expert having been sent for that purpose to Batopilas. This increase of plant will be completed with least possible delay. If, as promised, from 160 to 200 ft. a month can be made, the cost of working will be enormously reduced and yield correspondingly increased. On the whole, the condition of the company and its property is excellent, and we can look for its reaching a dividend-paying basis when tunnel shall have cut the Roncesvalles and Todos Santos veins, thereby giving low-grade ores in sufficient quantity to keep mill in constant operation.

HIDALGO.

PACHUCA.—No agreement as to a concerted plan of action has yet been reached among the companies affected by the flooding of the Pachuca mines, says the *Mexican Financier*. The disagreement is as to the proportion of the work properly appertaining to each, some of the managements averring that their neighbors are unwilling to bear their share of the burden. Some meetings have been held between the representatives of the several companies, but so far without result.

GUADALUPE HIDALGO.—This mine continues to look well, and some very good ore is being extracted. The eastern drift is still very wet, and is letting out a small quantity of water, but the powerful pumps can easily contend with it.

TAMAULIPAS.

CONCEPCION MINING COMPANY.—The shareholders of this company held a meeting in Monterey recently, and elected the following board of directors: Nathaniel Turner, J. A. Robertson, S. J. Breen, Byron C. Howell, Sr., and W. H. Wentworth. This company owns the Concepcion and Prieta mines, better known, perhaps, as the Carolina on the west, and the Todos Santos on the west. The adjoining mines are well known properties. Work has already begun on the Concepcion, and it is expected that the vein will soon be cut.

TURKEY.

BAIRMITCH LIGNITE MINES.—The Ministry of Agriculture, Mines and Forests is at present inviting tenders for the concession to work a lignite mine at Bairmitch, in the province of Broussa. The mine covers an area of 2,208 djeribs.

BALCANBOLI QUICKSILVER MINES.—The Ministry of Agriculture, Mines and Forests has granted a concession to work for 99 years a quicksilver mine situated in the nahie of Balcanboli, near Keuré, province of Aidin.

GART BORACITE MINES.—The Ministry of Agriculture, Mines and Forests is inviting tenders for a concession to work for 60 years a boracite mine situated at Garta, in the sandjak of Karassi, province of Broussa.

KOUVADJIK LIGNITE MINES.—The Ministry of Agriculture, Mines and Forests is inviting tenders for the concession to work three lignite mines situated near the village of Kouvadjik, in the caza of

Nazli, in the province of Aidin. These mines have been worked for some time, and the term of the concession previously granted has just expired.

LATE NEWS.

The Lamartine tunnel at Idaho Springs was completed March 30th, connection being made between the two ends. Mr. W. H. Wiley has had charge of the engineering, and the work is a credit to him as an experienced mining engineer.

Mr. ALEXANDER DICK, general manager of the Canada Coal & Railway Company, at Joggins, N. S., has resigned his position, and has been in New York during the present week. Mr. Dick's address for the present will be at Springhill, N. S.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 3.

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

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad.....	70,336	860,286	930,550

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

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	54,958	601,626	489,006
Barclay, Pa.....			
Beech Creek, Pa.....	174,971	786,661	819,812
Broad Top, Pa.....	111,614	112,331	135,141
Clearfield, Pa.....	109,280	1,213,508	1,123,433
Cumberland, Md.....	175,318	1,405,700	709,332
Kanawha, W. Va.....	188,013	952,228	965,289
Phila. & Erie.....	741	13,108	33,121
Pocahontas Flat Top.....	187,455	831,534	818,910
Totals.....	502,885	5,946,159	5,119,137

† Week ending March 21st.
‡ " " March 14th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	19,726	241,321	220,356
Pittsburg, Pa.....	35,264	491,418	531,594
Westmoreland, Pa.....	46,232	498,282	621,569
Totals.....	101,222	1,231,021	1,373,519
Grand totals.....	604,057	7,177,180	6,492,656

Production of coke on line of Pennsylvania Railroad for the week ending March 28th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 86,197 tons; year, 1,170,978; to corresponding date in 1895, 1,483,693 tons.

Anthracite.

The anthracite coal market has continued exceedingly quiet and utterly devoid of new features of interest. New business is still very light, but as the companies are restricting the output, materially the present movement of coal on old and new orders is sufficient to prevent alarming accumulations in producers' hands.

It is not expected that there will be any marked change in the existing conditions for six or eight weeks to come, but the companies are acting with business-like wisdom and they display little anxiety as to the future. The circular generally obtains on whatever business is doing and the reports about individual operators "shading" prices are not numerous. Quotations remain at \$1.60 for stove, \$3.35 for egg and chestnut and \$3.10 for broken, all net on board.

The steadiness which has characterized the market since the middle of February has had a favorable effect on both buyers and sellers. The former are still purchasing from hand to mouth, but it is because this is always done at this season of the year and not for fear of a sudden decline. Sellers have realized that it is not difficult to act conservatively, and at this time of dullness when they might have been forgiven for offering "concessions" to stimulate freer buying they have steadily adhered to the prices above quoted. It must be remembered, however, that it is when good customers are abundant that the true strength of the market will be shown, for the ability to resist temptation is strength. It is comparatively easy to "turn down" an order for a cargo or two; but one for 50,000 tons is another thing.

Bituminous.

The soft coal market has been active this week, especially during the early part when the demand was brisk owing to the desire to take advantage of the lower prices which prevailed previous to April 1st. Toward the close shippers were busy loading the vessels which did not arrive or could not load before the 1st, as they had expected to do, so that the entire week was fairly active. The next fortnight will in all probability be dull, as nearly all consumers have put in supplies of coal which will last them for some time and contractors are postponing sending in their orders for the year's business until they ascertain fully how strong the "combination" really is and what the chances are of a decline in prices in the near future. There are some rumors going the rounds of the trade concerning yearly contracts which are said to have been placed at the "combination's" figures, but these rumors are not confirmed. From all that can be learned the new association is holding its own steadily and there is naturally no disposition to "shade" prices as yet.

Of last week's shipments the greater portion went

to the near-by ports as vessels advanced their freight rates with the increased demand to such an extent as to offset the difference in prices between what coal was sold for before and after April 1st. Sound and New York harbor barges maintained their rates at what they had been and as a result drew practically all shipments to them, thereby making the bulk of the business go to Sound and New York harbor ports.

The various railroad through rates show changes in favor of the nearby all-rail business, and this tends to even up the advance in other cases, which went into effect last Wednesday.

Transportation from mines to tide has been fairly good, though not especially so in the early part, when coal was most needed. Now that the heaviest shipments are over, traffic conditions will improve. The same applies to the car supply.

There was a shortage of vessels during the early part of the week, owing to fogs which delayed arrivals that had been expected at the ports before April 1st. These vessels are now in, and are being loaded. The recent advance in ocean freights having been caused principally by the active demand before alluded to, the course of the vessel market now will probably be downward. Rates are nominally quoted as follows from Philadelphia: To Boston, Salem, Portland and Wareham, 90c.; Providence, New Bedford, New Haven, Allyn's Point, and other Sound ports, 80c.; Portsmouth, 95c.; Lynn, \$1; Newburyport, \$1.10; Dover, \$1.20 and towage; Saco, \$1.10 and towage; Gardiner, \$1.05 and towage; Bath, 95c.

The "Association" prices are as follows: F. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80; alongside New York Harbor, \$3. There is a 15c. differential in favor of Clearfield and Beech Creek coals.

Buffalo, N. Y. April 2.

(From Our Special Correspondent.)

The anthracite coal trade is very dull. There is no change in quotations. Warmer weather has decreased home consumption and orders from the interior are few and far between.

Bituminous coal quiet. Manufacturers are busy. To the surprise of your correspondent there are no changes in quotations announced. Bids for 30,000 net tons of run-of-mine bituminous coal were opened last Tuesday by the Bureau of Water in this city for the use of the pumping house. The bids were: Thomas Loomis & Co., \$1.65; Osborn, Seager & Co., \$1.65; Bell, Lewis & Yates, \$1.80; Hedstrom & Co., \$1.67; C. M. Underhill, \$1.85; Ball Bros., \$1.75; H. W. Linderman, \$1.73, and Mark Packard put in 10 bids of \$1.509, \$1.574, \$1.599, \$1.609, \$1.624, \$1.676, \$1.699, \$1.724, \$1.749 and \$1.75. No award was made. Osborn & Co.'s bid was for Pittsburg coal.

A new fueling dock with pockets is being constructed at Cleveland by the Pennsylvania Coal Company.

The lake opening dates of 1895 were: Buffalo harbor April 16th; Straits of Mackinaw April 11th; Sault Ste. Marie Canal April 25th; and Duluth and Superior harbor April 27th.

Any subscriber to the *Engineering and Mining Journal* can obtain a copy of the report on the coal trade of Buffalo for 1895 and preceding years free of cost by writing to the compiler, Secretary Thurstone of the Merchants' Exchange, Buffalo, N. Y.

On March 27th the ice moved out of Buffalo River without any accidents occurring.

The Buffalo Water Works pumping station is to have a new coal storage house with a capacity of 5,000 tons.

The Northern Steamship Company has leased the Pennsylvania Coal Company's docks in this city, and will erect a large freight house thereon. It is reported that the Pennsylvania people have consolidated their interests with several other companies and will use the new river trestles for handling coal for shipment on the lakes.

It is understood that the present schedule of anthracite coal prices will continue until July 1st.

Chicago. April 1.
(From Our Special Correspondent.)

There has been no improvement in the anthracite coal trade at this point, business in general having been very discouraging. The weather has been moderate, and consequently it offered no support. Stocks of hard coal on hand by the average dealer are small, and but little effort is being made to replenish supplies that in good times would be considered ridiculously small. There are those who assert that, despite the poor business, quotations are being adhered to, but it is only too apparent that circular rates are held to in but few instances.

Bituminous coal remains in the same condition and a small tonnage of it is being placed. Trouble is brewing in the coalfields of Indiana and Illinois, and only prompt action can prevent a strike there.

Coke is selling fairly well, the demand being mostly for the best grades. Coke prices are for Connellsville from \$5 to \$5.25.

Anthracite coal prices, being circular rates, are for egg, stove and nut, \$5.50, and grate, \$5.25.

Pittsburg. April 2.
(From Our Special Correspondent.)

Coal.—The Allegheny and Monongahela are at flood height, in fact there has been good boating water all week; as a result coal has been shipped as fast as mined, hence there is no accumulation of stock. The coal shipments for the first quarter of 1896 were large. The wage question that has been announced as settled several times is still unsettled. De Armit has not given his consent to a partial

uniformity; hence another meeting has been called; and the result is anxiously awaited. The general opinion is that too much has been done to allow the movement to fail; it is too near perfection, but it must not be smoothed over by trying to go ahead with the general situation unchanged. De Armit has reduced his demand to 95%. It was suggested that the miners would take up the fight against those operators who refuse to join, but their defence was declined. One of the largest coal land deals on record has been consummated by A. B. Copeland, of Parnassus, at Greensburg. He represents a syndicate of capitalists and has secured 12,000 acres of coal land in Westmoreland and Allegheny counties. Work will be commenced in a few weeks. Two shafts are now being sunk on the property.

Connellsville Coke.—There was a slight increase in coke shipments owing to the plants making better time than they did the previous week. The wage reductions by some of the iron firms in the Pittsburg districts are regarded as bad forerunners, though \$2 coke for April is assured. Pocahontas coke is extending its market some under existing conditions, chiefly at Cleveland, where foundry from that region is being sold at \$3.40, or \$1.75 at the oven. This is against \$4 for Connellsville foundry coke at Cleveland. The detailed operations and output of the week show 12,118 active ovens and 5,829 idle ones, with an estimated production of 123,310 tons. This is an increase of over 3,000 tons compared with the previous week. In the active list of ovens there was a gain of 23. W. J. Rainey has all his 1,500 ovens in blast except 10 that are being repaired. The Corcoran ovens have an equally good record, but their coke is being handled by the H. C. Frick Coke Company. The Ohio Coke and Furnace Company have banked the 90 ovens at Oliver No. 2. The shipments for the week were 6,527 cars as follows: To Pittsburg and River tipples, 1,940 cars; to points west of Pittsburg, 3,580 cars; to points west of Connellsville, 1,027 cars; this shows a week's increase of 74 cars. Prices show no change.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 3, 1896.
Fig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '95.	From Jan., '96.
	April 5, 1895.	April 3, 1896.		
Anthracite.	F'ces. 34	Tons. 20,005	F'ces. 51	Tons. 33,270
Coke.	121	131,611	137	162,676
Charcoal.	17	3,765	19	5,360
Totals	172	155,381	207	201,300
			2,281,220	2,819,517

The general market conditions do not differ much from those reported a week ago. There is a tendency to ask higher prices in most quarters, but buyers are not yet ready to concede advances.

The sensation of the week has been in the meetings held to arrange for the formation of a combination by the makers of steel billets. A good deal of secrecy has been attempted in this connection, the place for the last meeting, which begun in New York on Thursday, having been changed at short notice to avoid publicity. While it is formally denied that any actual pool or combination has been formed, there is no doubt that an understanding has been reached, the first evidence of which is a general increase in the price of billets to \$20 per ton at mill, which means \$22.50@23 at tidewater. Various statements as to the terms of the pool have been published, but we are assured that none of them are correct.

It will be remembered that any agreement on the selling price of billets will not affect the large concerns which work the steel into finished products in the mills which they own or control. The combination—or understanding—practically puts the market for finished steel in the hands of those concerns, leaving the mills which work up purchased billets at their mercy.

The steel-makers who joined in the meetings were the Carnegie, the Hainsworth and the Schoenberger steel companies, Jones & Laughlins and Park Brothers, all of Pittsburg; the Illinois Steel Company, Chicago; the Pennsylvania Steel Company, Harrisburg; the Ohio Steel Company, Youngstown; the Troy Steel Company, Troy; the Midvale Steel Company, Philadelphia; the Bethlehem Iron Company; the Wellman Steel Company, Thurlow, Pa.; the Lackawanna Iron and Steel Company, Scranton, Pa.; the Lickdale Iron Company, Lebanon, Pa.; the North Branch Steel Company, Danville, Pa.; the Cambria Iron Company, Johnstown, Pa.; the Shenango Valley Steel Company, Newcastle, Pa.; the Maryland Steel Company, Sparrow's Point, Md.; the Johnson Company, Lorain, O.; the Cleveland Rolling Mill Company, Cleveland, O., and the Junction Iron and Steel Company, Mingo Junction, O.

The Alabama iron producers have made a preliminary agreement to regulate sales and prevent undue cutting of prices. The combination includes nearly all the furnaces and the plan provides for a joint selling agency which will distribute the orders among the furnaces. It is understood that minimum prices were agreed to, and that these are, for the present, \$8 at furnace for No. 1 foundry, \$7.50 for No. 2, \$7.50 and \$7.25 for Nos. 1 and 2 soft, and \$6.50 for gray forge. Adding the freight, \$3.75 from Birmingham, these are about current New York rates.

The Merchant Bar Iron Association met in Cleveland, O., yesterday, and is in session to-day. The

object of the meeting is to check the demoralization which has prevailed in the association, and to devise some way of preventing the cutting in prices. The association has not been in very good condition, and there are a good many makers who do not recognize it.

NOTES OF THE WEEK.

The block of 50 new Smet-Solvay coke ovens at Dunbar, Pa., is now nearly ready to go into operation, and it is understood that they will be started up without delay.

At the last meeting of the directors of the Tennessee Coal, Iron and Railway Company a committee consisting of Messrs. J. T. Woodward, W. S. Gurnee and James Swann, was appointed to consider the erection of a steel plant by the company.

The manufacturers of wire nails held a meeting in New York this week and fixed the price at \$2.55 per keg, an increase of 15c. over the recent list. The combination claims to control substantially all the production.

A Chicago dispatch says that on April 2d the Illinois Steel Company, instead of filing an answer in the quo warranto proceedings recently begun against it, the company, filed a demurrer to have the information filed by the Attorney-General withdrawn, because it is "indefinite, insufficient and incorrect." The demurrer also asserts that the Attorney-General has not set forth any unlawful act or usurpation in which the people are interested which is any concern of the Attorney-General or which would be a ground for the forfeiture of the charter. The argument on the demurrer will be had shortly.

New York. April 3.

The local market has been active in some directions, but in others quieter than usual. The general apprehension that higher prices for raw material would be enforced has caused a good deal of buying, but, on the other hand, there have been fewer small orders from the machine shops, and there is some complaint from the tool builders and engine makers that new orders are not coming in. The Newark shops are still pretty busy, but some of them say they are getting ready for a slack summer, though others profess that they have work in sight for some time to come. The Eastern shops are also inclined to be a little doubtful as to the coming season, and, with the exception of a few which work on special branches, are looking rather closely after orders and not inclined to increase their stocks in advance.

Fig Iron.—There has been a good deal of iron bought this week, especially by the pipe foundries. The latter are all busy, while others are inclined to put in stock because they rather anticipate higher prices. The action of the Alabama furnaces has stiffened prices of Southern iron somewhat, but on the other hand there has been some shading by Northern makers in order to meet the competition, though no general reduction has been agreed to, and probably none will be. The result is a little wider range of prices than usual.

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

Cast-Iron Pipe.—A number of contracts are on the market, both large and small, and a good deal of canvassing is going on. Late buyers will have to wait for deliveries. The large Boston contracts were taken at \$19 per ton for 2,800 tons pipe, 12 to 20 in.; \$19.80 for 2,400 tons over 16 in.; \$20.25 for small pipe under 10 in.

Spiegeleisen and Ferro-Manganese.—No business has been done and we continue to quote nominally \$19@20 per ton for spiegeleisen and \$17@17.50 for ferro.

Steel Billets and Rods.—The market is unsettled, in view of the action of the steel-makers. Few transactions are noted, and holders are unwilling to sell, unless at an advance. About \$22.50 per ton, tidewater, is talked of for billets. Rods are also firmer, and \$26@27 is asked, with few sales.

Merchant Iron and Steel.—The market is not very active, and there are fewer small orders. Prices are unchanged, except for steel bars, which are higher. We quote for common bars, 1 1/2@1 1/2c.; refined bars, 1 1/2@1 1/2c.; soft steel bars, 1 3/4@1 1/4c. Other quotations are as follows: Open hearth machinery steel, 1 5/8@1 1/2c.; steel hoops, 1 5/8@1 1/2c.; steel axles, 1 6/8@1 1/2c.; links and pins, 1 6/8@1 1/2c.; tire steel, 1 8/8@2c.; spring steel, 2 1/8@2 1/2c. Rivets are 2 2/8@2 3/8c. for steel, and 3@3 3/8c. for iron.

Plates.—Business is quiet and prices about the same. Universal mill plates are 1 1/2@1 1/2c. For steel plates we quote: Tank, 1 1/2@1 1/2c.; boiler shell, 1 5/8@1 1/2c.; good flange, 1 8/8@1 1/2c.; firebox, 2 1/8@2 1/2c. Charcoal iron plates are 2 2/8@2 3/8c. for shell, 2 7/8@2 8/8c. for flange, and 3 2/8@3 3/8c. for firebox.

Structural Iron and Steel.—Business continues good and orders seem to be coming on the market well. Some local contracts of good size are in sight. In prices there is no change. We quote for angles, 1 1/2@1 1/2c.; channels, 1 6/8@1 1/2c.; tees,

1.65@1.75c.; beams (up to 15-in.), 1.65@1.75c. for large lots and 1.90@2.10c. for small orders.

Steel Rails and Rail Fastenings.—Rails are unchanged at \$28 per ton at mill, or \$28.75 at tide-water for standard sections. Girder and street rails are \$28@32 per ton at mill, according to section. No new business is noted.

Rail fastenings are quiet and unchanged. Quotations are: For fish and fangle-plates, 1.25@1.35c.; spikes, 1.65@1.80c.; bolts, 1.95@2.05c. for square nuts, and 2.05@2.15c. for hexagon nuts.

Scrap Iron.—Foundry scrap is not especially active, but demand is equal to supply. We quote \$9@ \$11 per ton, according to size and quality of lots.

Buffalo.

April 2.

(Special Report of Rogers, Brown & Co.)

There has been less activity this week than last, although the market has appeared to have a little stronger tone. As spring advances there is more call for foundry iron, making shipments from the furnaces more active. We quote on cash basis f. o. b. cars Buffalo, as follows: No. 1 foundry, strong coke iron, Lake Superior ore, \$13.50; No. 2 foundry, strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.70; Ohio strong softener No. 2, \$13.20; Jackson County silvery No. 1, \$15.25@15.75; Southern soft No. 1, \$12.50; Southern soft No. 2, \$11.90. Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14@14.50.

Chicago.

April 1.

(From Our Special Correspondent.)

The market for the past week remains unchanged, there being about the same amount of business transacted as in the preceding week. Quite a reduction in the rates on steel has been made by the Chicago committee on eastbound roads to points in the East, to become effective April 10th. Rates from Chicago on carloads of 12 tons or over will then be: To New York \$4 per gross ton of 2,240 lbs.; to Boston, \$4.40; Philadelphia, \$3.60; Baltimore, \$3.40; Albany, \$3.80; Utica, \$3.60; Syracuse, \$3.20; Rochester, \$3; Binghamton, \$3.60; Elmira, \$3.40; Buffalo, Suspension Bridge, Dunkirk, Oil City, Salamanca, Pittsburg, Wheeling and Bellaire, \$2.50.

Pig Iron.—But little change is noticeable in the pig iron market over last week. Sales in the aggregate are a trifle larger, possibly 5,000 tons. Prices are not particularly firm, though there is a deal of effort made to make them so. Southern furnaces appear to be the disturbing element in the matter of prices, as they are willing to cut to get business. We quote: Lake Superior charcoal, \$13.50@14; local coke foundry No. 1, \$12.50@13; local coke foundry No. 2, \$12@12.50; local coke foundry No. 3, \$11@12; local Scotch foundry No. 1, \$12.50@13; local Scotch foundry No. 2, \$12@12.50; local Scotch foundry No. 3, \$11@12; Southern coke No. 1, \$12.35@12.85; Southern coke No. 2, \$11.60@11.85; Southern coke No. 3, \$11.35@11.60; Southern No. 1 soft, \$11.60@11.85; Southern No. 2 soft, \$11.35@11.60; Southern silveries, No. 1, \$11.85@12.35; Southern silveries, No. 2, \$11.60@11.85; Jackson County silveries, \$14.70@15; Ohio silveries, No. 1, \$15@15.50; Ohio silveries, No. 2, \$14.50@15; Ohio strong softeners, \$15@15.50; Alabama car-wheel, \$16.85@17.35; malleable Bessemer, \$13; coke Bessemer, \$13@14.

Bar Iron.—Trouble prevailing in the Bar Iron Associations, the prices of bars have gone down considerably, the quotation on common iron being 1.20@1.25c. There has been no business of importance transacted, sales having been but for small quantities.

Structural Material.—Business during the week has been fair and prices are quite firm. A large building is about to be erected at State and Washington streets, and the contract for the steel has been let. A few small bridge contracts have been placed. Beams and channels, 1.65@1.70c. Plates, 1.60c.; angles, 1.55@1.60c.; tees, 1.70c.

Steel Rails.—The Illinois Central Railroad is said to have placed an order with the Illinois Steel Company for 15,000 tons of rails. General business for the week has been fair, a number of small sales having been made. Quotations on rails are \$29, Chicago.

Billets and Rods.—Some sales of billets have been made and about 4,000 tons of rods have been booked for early delivery. Billets are quoted \$19.50 and Rods \$25.

Old Rails and Wheels.—There are no sales of wither old rails or wheels observed during the week. Old iron rails are quoted about \$14, and old wheels \$13@13.50.

Cleveland, O.

April 2.

(From Our Special Correspondent.)

Iron Ore.—While no sales of Bessemer ore have been reported this week, the situation in this market is strong. There have been a number of negotiations opened with buyers, and the dealers say that within 10 days some business will probably be closed. There is not the talk that was heard last week to some extent, to the effect that the furnacemen might hold off with the view of breaking the rates which the shippers have just established. No doubt is expressed that the prices will be maintained as fixed. The reported formation of a steel combine this week has had a stimulating effect upon both the iron ore and the iron markets. There have been some inquiries for non-Bessemer ores also, and several sales of this quality have been made.

From the docks the winter ore is now moving to the furnaces quite freely. There will be consider-

ably lower stocks at hand when navigation opens than there were a year ago.

Until sales of ore have been made it is said there will be no chartering of vessels. Within a few days conferences have been held between the shippers and the carriers and each is advised of the wishes of the other. The ore men are looking for dollar boats. The vessel men are unwilling to charter under \$1.10. Recent estimates are that the St. Mary's River will open for navigation about April 20, or a little earlier than anticipated a week ago, that is unless the weather in the meantime should prove phenomenal.

Pig Iron.—In the Bessemer product there has been a marked advance in price during the week. Makers are now declining prices which a week ago would have been considered high. At Cleveland the price of Bessemer is quoted at \$13.75, or \$1.25 above the last report. This strength is attributed partly to the strength of the iron ore market, partly to the reports of an agreement among the steel manufacturers but mainly perhaps to a much more active inquiry for the product. This activity has not reached the foundry irons. They stand at the same figure as a week ago, \$12.50 and \$12 for Ohio Scotch Nos. 1 and 2 respectively; \$12.50@13 for Northern strong. Southern irons have advanced about 50c. in this market. Quotations follow: No. 1 foundry, \$11.9; No. 2, \$11.40; No. 1 soft, \$11.40; No. 2 soft, \$11.15. Steel billets have gone up sharply. They are quoted at \$21.75, Cleveland.

Philadelphia.

April 3.

(From our Special Correspondent.)

Pig Iron.—The iron trade has been disturbed a good deal, but not particularly unsettled by the talk of combination South for higher prices, the possibility of a stoppage of lake ore supplies and the big billet combination. Then there are other matters, chief of which is the possibility of a general expansion of demand early in the summer, which might reproduce in a measure the disastrous experience of last year. The outcome of all these influences during the past 48 hours has been to increase business in pig iron. There is no change in price, no threat to change, no large orders and no anxiety to buy other than as has been customary for weeks past. Usual quotations are \$13@13.25; No. 2, \$12.25@12.50; gray forge, \$11@11.50; standard Bessemer, \$13 at furnace bank.

Muck Bars.—In view of the probable advance in steel, there is greater interest in muck bars, though there are no sales.

Billets.—Prices must be upwards of \$22.50, adding freights for Pittsburg (\$2.30), but just now there is no change to announce. There was a sale yesterday at \$21. The buyers are not getting scared, and will not do anything rash.

Bars.—The harmony of a few short weeks is giving place to apprehension of a renewal of shading and cutting, which it was vainly hoped had been removed altogether. The latest sales of bars in a large way was at 1.15, but certain qualities of iron can be and are had at 1.05@1.10. Stores get 1.40@1.50 for refined iron.

Sheets.—The improvement since Monday has been due to the acceptance at shaded quotations of offers made by manufacturers. Card, 1.80 (No. 1) up to 2.80 (No. 28). Galvanized is beginning to be ordered with considerable freedom.

Wrought Pipe and Tubes.—No special activity is observed, but manufacturers assert that, with the general improvement near at hand, they will catch their share.

Merch Steel.—Manufacturers say there is a better feeling growing out of the greater activity in a multitude of shops and places where small purchases are made.

Skelp.—There have been no further developments.

Plate and Tank.—Most mills have business ahead. The current requirements continue to be large. Boiler plate and tank are particularly active. There is a fair opening up of probabilities of right good business. Tank plates are 1.45; shell, 1.50; flange, 1.60@1.70; firebox, 1.90@2.00. The spring and early summer outlook is good.

Structural Material.—The mill men are all hopeful of a good volume of business coming in during this month. The local demand for shapes will be double what it was last year, and we hope to keep all the city business here. Angles are 1.45; beams and channels, 1.60 up.

Steel Rails.—They are lost sight of.

Old Rails.—They are held entirely too far above buyers' views.

Scrap.—The only scrap urgently wanted is railroad at \$14, and car wheels at \$12.

Pittsburg.

April 2.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business conditions during the week have changed decidedly for the better. There is altogether more hopefulness in the iron and steel trade outlook as an evidence that consumers have about made up their minds that prices will go no lower; as a result of this several good-sized blocks have been disposed of at an advance of 25c. per ton for Bessemer. The general merchandise distribution has been restricted by the slow collections and recent commercial failures. The iron and steel trade conditions have changed slightly for the better, but the announcement of the

season's prices for Lake Superior ores has removed uncertainty as to the future costs and has exercised a steadying effect upon prices of Bessemer pig. The cost of production on the basis of \$4 Lake ore and \$2 coke has been estimated somewhere between \$12.75 and \$13 per ton at this point, the sales reported last week at \$12.25 and \$12.50 were made from ore at \$2.90 and \$3 per ton and low price coke. Sufficient Mesabi and Norrie ore to smelt a ton of Bessemer pig iron would cost in Pittsburg (based on new prices) \$8.20; from the above facts it will be perceived that the days of cheap Bessemer pig are about over.

The difficulties that caused the closing of the Solar Iron Plant has been satisfactorily arranged; the works will resume operations at an early day giving employment to between 400 and 500 men. The price of standard ores being settled, at least for some time to come, furnacemen will be able to tell what it will cost to make a ton of iron; that fact being ascertained they can set prices at which sales can be made. Some parties claim that Bessemer will command an advance in the near future. We heard a report that 40,000 tons of Bessemer was sold last week independent of the sales previously reported.

The Latest.—The boom in iron and steel that we have waited on so long has come to hand and is what may be termed the largest one since last year. In our last report there were large sales of Bessemer pig at \$12.25@12.40 Pittsburg. The present report contains large operations in Bessemer at \$13.50@13.75; advance \$1.35 per ton. Steel billets advanced from \$17.50@17.75 to \$16.50@20, an advance of \$2.50@3.25 per ton. Muck bar advanced \$1. Bloom, billets and bar ends advanced \$1; steel wire rods advanced \$2.50. Sheet bars advanced \$2.75. There were other advances but the above is sufficient for the present.

COKE SMELTED, LAKE AND NATIVE ORE.		Tons.		Cash.	
10,000	Bessemer, Apr. May, June, Pits.	800	Sheared, Pits.	\$1.50	4 m.
		800	Wide grooved, Pits.	1.30	4 m.
		800	Narrow grooved, Pits.	1.30	4 m.
SKELP IRON.		Tons.		Cash.	
8,000	Bessemer, May, June, Pits.	1,000	Sheared, Pits.	\$1.30	4 m.
6,000	Bessemer, May, June, Pits.	700	Wide grooved, Pits.	1.20	4 m.
5,000	Bessemer, Apr. May, Pits.	550	Narrow grooved, Pits.	1.20	4 m.
5,000	Bessemer, Apr. May, Valley.				
5,000	Bessemer, May, June, Pits.				
5,000	Bessemer, Apr. May, Pits.	1,500	Neutral, at mill, Pits.	\$22.00	
4,000	Bessemer, May, Valley.				
2,000	Bessemer, prompt, Valley.	1,000	Billet and bar ends, Pits.	\$14.00	
2,000	Gray Forge, May, June, Pits.				
1,000	Gray Forge, April, May, Pits.	1,000	Delivered, Pits.	\$22.75	
400	No. 2 Foundry, prompt, Pits.	1,000	5-gauge, at mill, Pits.	\$25.00	
400	Bessemer, spot, Valley.				
200	Mill Iron, prompt, Pits.	100	Prime, Pits.	\$4.05	
BLOOMS, BILLETS AND SLABS AT MILL.		Tons.		Cash.	
5,000	Billets, Apr., May, June, at mill.	50	80% Pits.	\$50.00	
3,000	Billets, Apr., May, June, at mill.	500	Steel rails, Pits.	\$14.00	
2,000	Billets, Apr., May, June, at mill.	500	Iron rails, Pits.	16.50	
CHARCOAL.		Tons.		Cash.	
100	No. 2 Foundry, Pits.	500	Cast scrap, gross, Pits.	\$11.50	
50	Cold Blast, Pits.	350	Busheling, net, Pits.	12.75	
50	Cold Blast, Pits.	300	No. 1 railroad wrought, net, Pits.	13.50	
50	No. 2 Foundry, Pits.				

METAL MARKET.

NEW YORK, Friday Evening, April 3, 1896.

Gold and Silver.

Prices of Silver per Ounce Troy.

Mar.	St. Ex.	London Pence.	N. Y. Cts.	Value of \$1. in \$.	Apr.	St. Ex.	London Pence.	N. Y. Cts.	Value of \$1. in \$.
28	4 88 1/2	31 1/4	68 1/2	.527	1	4 88 1/2	31 1/4	68 1/2	.527
30	4 88 1/2	31 1/4	68 1/2	.529	2	4 88 1/2	31 1/4	68 1/2	.526
31	4 88 1/2	31 1/4	68 1/2	.529	3	4 88 1/2	31 1/4	68 1/2	.526

The United States Assay Office in New York reports the total receipts of silver at 34,000 oz. for the week.

The market for silver the past week has not shown any particular animation. The Eastern exchanges have been declining and the full allotment of Council bills on Wednesday together with the usual dullness incident to the Easter holidays have caused a rather limited demand.

Average Monthly Price of Silver

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

Month.	1896.		1895.		1894.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January	30 69	67 13	27 36	59 69	30 81	66 63
February	31 69	69 94	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 28	59 49

The London price is per standard ounce .925 fine; the New York price is per fine ounce, or for pure silver.

Gold and Silver Exports and Imports.

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

	Specie and bullion.		In ores.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
Feb.	\$2,183,700	\$11,559,089	\$7,101	\$10,008	I. \$9,468,296
1896.	12,759,226	21,927,029	56,953	279,020	I. 9,398,870
1895.	27,495,022	6,863,533	275,432	142,824	E. 20,764,694
SILV.					
Feb.	5,362,319	1,411,967	45,415	1,302,314	E. 2,633,413
1896.	10,235,618	2,469,561	471,876	2,795,216	E. 5,472,724
1895.	6,828,222	1,058,171		1,676,563	E. 4,093,408

Gold and Silver Exports and Imports, New York

For the week ending April 3d, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week					
1896.	\$17,729	\$897,400	\$45,214	\$	E. \$838,157
1895.	\$10,164,985	16,127,567	6,509,417	520,509	E. 4,026,286
1894.	29,359,612	13,254,451	7,704,437	367,817	E. 23,411,761
1893.	6,695,669	3,372,238	1,323,645	449,638	E. 14,197,433
1892.	36,976,175	5,661,419	8,016,786	867,703	E. 38,493,839
1891.	12,825,230	5,825,869	7,283,061	356,419	E. 13,925,998

There were no gold exports during the week; of the silver, \$500 went to Germany, \$102,000 to France, and the remainder to London. The gold and silver imported came chiefly from South America.

FINANCIAL NOTES OF THE WEEK.

The two financial events of the week have been the fireworks exhibition of the Tobacco Trust Company and the complete fiasco in obtaining bids for the New York City 3% bonds.

The Tobacco Trust Company has exhibited itself in methods quite as bad as those of the Cordage Trust, and not very unlike those of the Sugar Trust; that is to say, the insiders are simply looked upon as playing with loaded dice and preying upon unwary speculators who are tempted to deal in the stock on account of the rapid market movements. There is no explanation even offered for having passed the dividend in December last, and now the declaration of a 2% cash dividend on the common stock with a bonus of 23% in scrip, thereby adding a heavy annual charge against the company's profits is considered by conservative bankers as a trick either to catch unwary "bears" or to raise the price of the stock to a figure at which the insiders can afford to get out of their large holdings and yet allow for a heavy fall while they are unloading. The situation from a commercial point of view has not improved since December last, and the competition of strong outside concerns is just as keen as ever.

The bids asked for on Thursday for \$4,340,614 3% New York City bonds has been a great disappointment to the city authorities, and it is the first time in 10 years that bankers and investors have failed to respond at good prices. Of the total amount the Comptroller only received proposals for \$175,000. Some of these bonds had the same period to run as the recent issue of the United States Government 4% bonds, and it was confidently expected by the Comptroller that a very favorable comparison could be made between the result of the two issues, so nearly concurrent in favor of the credit of New York City. The amount taken is so trifling that it is scarcely worth while to make any such comparison, but the bids did actually arrange for \$100 up to \$111.25.

The causes for this failure is attributed to several conditions now existing under recent and pending legislation at Albany. Bankers as a rule do not consider that it is at all owing to any scarcity of loanable money, and this certainly is corroborated by the rate for money on first-class securities in the street. It is expected that a large portion of the revenue from excise properly belongs to the city will be absorbed by the State under the new act. Lastly, there is so much uncertainty as to the burdens to be carried by the city of New York under the bill for the creation of "Greater New York" that investors naturally wish to see "where they are at."

The March debt statement shows an increase in the bonded debt during the month of nearly

\$15,000,000, that amount having been issued on account of the recent 4% loan. There still remains to be issued \$10,000,000 of this loan to complete the \$100,000,000. The free gold stands at \$128,646,461, an increase of \$4,683,482 since March 1st. Exclusive of the \$100,000,000 gold reserve, the net cash balance is \$171,641,748, an increase during the month of nearly \$9,000,000. The silver fund, exclusive of fractional coins, aggregates \$493,684,370, all of which is covered by outstanding certificates and Treasury notes except \$53,000,000.

The receipts for the month were \$26,000,000, an increase of about \$600,000 compared with March, 1895. In customs receipts there was a decrease of \$1,500,000 compared with the same month of last year, but the increase in internal revenue more than overcomes this decrease in customs. The expenditures for the month were \$27,274,994, an increase over the corresponding month of last year of \$1,500,000 in round numbers. The third quarter of the fiscal year closed with March, and the results show a marked improvement over those for the corresponding period of the preceding year. The total receipts for the nine months were \$250,609,810 against \$236,346,767 for the corresponding months of 1895. The expenditures during the nine months just closed were \$269,360,542, against \$272,888,920 for the same months of the preceding year, a reduction in favor of the current year of \$3,500,000.

The annexed tables show the receipts and expenditures for the nine months ending March 31, 1895 and 1896 respectively:

	RECEIPTS.	
	1895.	1896.
Customs	\$115,534,962	\$126,966,299
Internal revenue	109,992,656	110,464,144
Miscellaneous	10,819,149	13,239,397
Total	\$236,346,767	\$250,609,810

	EXPENDITURES.	
	1895.	1896.
Civil and miscellaneous	\$73,333,289	\$66,161,619
War	39,574,196	40,499,476
Navy	22,524,939	20,562,616
Indians	7,802,659	9,918,033
Penions	106,294,311	105,251,816
Interest	24,359,516	26,966,982
Total	\$272,888,920	\$239,360,542

The net result shows a deficiency for the nine months of \$18,750,702, against \$36,542,153 for the nine months of 1895.

The Secretary of the Treasury, on April 1st, proclaimed the exchange value of foreign silver coins in the terms of United States currency for the ensuing quarter, in accordance with the customary quarterly estimate made by the Director of the Mint. The new values established show a nearly uniform increase over those of January 1st, 1896, expressed in mills as follows: Boliviano of Bolivia, 2; peso of Central America, 2; Shanghai tael of China, 4; Haikwan tael, 4; Tientsin tael, 4; Chefoo tael, 4; peso of Colombia, 2; sucre of Ecuador, 2; rupee of India, 1; yen of Japan, 3; dollar of Mexico, 3; kran of Persia, 1; sol of Peru, 2; ruble of Russia, 2, and mabhub of Tripoli, 2. The average price of silver for the three months ending March 31st, upon which the valuation of the silver coins is based, was 62.2c. per ounce.

Official figures of government receipts and expenditures for March will show a deficit for the month of \$1,250,000 and for the year to date \$19,000,000. The receipts for March foot up \$26,000,000, a slight increase over March, 1895, and about the same figures as for February, 1896.

The result of the Chinese Anglo-German loan offered during this week in London and Berlin is very satisfactory to the contracting parties. It is true the rate of interest offered, viz., 5%, is comparatively high for an empire of such large resources, and honestly collected customs revenues as China. The amount of the loan is \$16,000,000, and in consequence of the enormous application, both in Germany and London, the list of subscribers was closed six hours before the time advertised for cessation of bids. The portion of the loan that had been previously agreed to be allotted in London was over-subscribed for four times, and the German subscriptions were even greater in excess proportionately to the amount reserved for that country.

The statement of the United States Treasury on Thursday, April 2d, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	March 26.	April 2.	Changes.
Gold	\$128,243,388	\$128,684,488	I. \$440,900
Silver	21,339,159	20,399,264	D. 1,039,895
Legal tenders	79,021,572	80,584,716	I. 1,563,144
Treasury notes, etc.	31,902,248	32,173,665	I. 1,271,417

Totals.....\$260,566,567 \$261,835,263 I. \$1,268,696
Government deposits with national banks on the same date amounted to \$27,074,931, an increase of \$1,940,788 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$136,153,280. Against these are held in the Treasury 14,382,045 coined standard silver dollars, and silver bullion purchased at a cost of \$121,771,235, making a total of \$136,153,280.

The statement of the New York banks—including the 6 banks represented in the Clearing House—for the week ending March 28th, gives the following

totals, comparisons being made with the corresponding weeks in 1895 and 1894:

	1894.	1895.	1896.
Loans and discounts	\$143,798,700	\$182,524,100	\$164,986,400
Deposits	517,744,200	504,240,200	482,215,500
Circulation	11,214,100	12,895,600	14,160,000
Specie	100,184,200	65,578,900	58,931,900
Legal tenders	120,352,00	73,894,100	79,769,400
Total reserve	\$220,536,200	\$139,473,500	\$138,701,350
Legal requirement	136,916,050	126,010,050	127,553,875
Surplus reserve	\$83,620,150	\$13,463,450	\$11,147,475

Changes for the week this year were increases of \$18,000 in circulation, and \$416,600 in specie; decreases were \$2,529,900 in loans; \$5,842,600 in deposits; \$2,772,500 in legal tenders, and \$895,250 in surplus reserve.

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

	Gold.		Silver.		Total.
	1895.	1896.	1895.	1896.	
Asso. Banks of New York					
1895.	\$235,313,475	\$235,313,475	790,383,375	790,383,375	\$1,025,696,850
1896.	188,721,100	188,721,100	309,958,082	309,958,082	\$498,679,182
Bank of England					
1895.	487,617,125	487,617,125	311,736,250	311,736,250	\$799,353,375
1896.	521,869,619	521,869,619	309,958,082	309,958,082	\$831,827,701
Imp. Bank of Germany					
1895.			235,400,000	235,400,000	\$470,800,000
1896.			259,820,000	259,820,000	\$519,640,000
Austro-Hungarian Bank					
1895.	131,100,000	131,100,000	65,792,000	65,792,000	\$196,892,000
1896.	89,607,000	89,607,000	68,444,000	68,444,000	\$158,051,000
Netherlands Bank					
1895.	13,116,000	13,116,000	34,855,000	34,855,000	\$47,971,000
1896.	21,408,000	21,408,000	35,381,000	35,381,000	\$56,789,000
Belgian National Bank					
1895.			18,953,000	18,953,000	\$37,906,000
1896.			24,247,000	24,247,000	\$48,494,000
Bank of Spain					
1895.	40,022,000	40,022,000	52,223,000	52,223,000	\$92,245,000
1896.	40,021,000	40,021,000	62,128,000	62,128,000	\$102,149,000
Bank of Italy					
1895.	60,015,000	60,015,000	10,305,000	10,305,000	\$70,320,000
1896.	59,790,000	59,790,000	12,150,000	12,150,000	\$71,940,000
Imp. Bank of Russia					
1895.	351,560,000	351,560,000	45,450,000	45,450,000	\$397,010,000
1896.	274,075,000	274,075,000	52,185,000	52,185,000	\$326,260,000

The return for the Associated Banks of New York is of date March 28th; all the others are of date March 26th, except the Bank of Italy, which is dated February 29th, and the Bank of Russia, whose return is dated February 16th-28th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports its gold only, not considering silver at all. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to March 19th are reported by Messrs. Pixley & Abell's circular as below:

	1895.	1896.	Changes.
India	£1,116,730	£1,136,298	I. £19,568
China	777,750	247,050	D. 530,700
The Straits	136,205	116,882	D. 19,323
Totals	£2,030,685	£1,500,230	D. £530,455

Arrivals for the week this year were £193,000 in bar silver from New York, £3,600 from South America; £41,000 in Mexican dollars from New York; a total of £237,000. Shipments for the week were £98,000 in bar silver to Bombay and £35,000 to Japan; £5,400 to the Straits, and £30,500 to China; a total of £168,900.

There has been a remarkable falling off in the demand for Indian exchange, chiefly due to the temporary abundance of money in that country, the consequent cessation of demand from the banks, and to the absence for the present of Chinese orders. The applications for Council bills were much less than the 60 lakhs offered, and the price declined to 14 5/16d. per rupee.

The following statement from the Bureau of the Mint shows the coinage executed at the mints of the United States during the month of March, 1896:

Denominations.	Pieces.	Value
Double eagles	77,015	\$1,540,300.00
Eagles	13	130.00
Half eagles	16	80.00
Quarter eagles	18	45.00
Total gold	77,062	\$1,540,555.00
Silver dollars	1,500,287	1,500,287.00
Half dollars	287	143.50
Quarter dollars	672,287	168,071.75
Dimes	150,287	15,028.70
Total silver	2,323,148	\$1,683,530.95
Five cent	410,787	20,539.35
One cent	2,827,787	28,277.87
Total minor	3,258,574	\$48,817.22
Total coinage	5,638,784	\$3,272,903.17

The principal coinage in March was of silver dollars; that of gold being comparatively light.

Domestic and Foreign Coins.

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

	Bid	Asked
Mexican dollars	\$0.54 1/4	\$0.55 1/4
Peruvian soles and Chilean pesos	48 1/2	50
Victoria sovereigns	4.87	4.90
Twenty francs	3.88	3.92
Twenty marks	4.75	4.80
Spanish 25 pesetas	4.78	4.85

Other Metals

At the annual election of the New York Metal Exchange March 30th, the following officers were chosen: President, Robert M. Thompson, of Orford Copper Company; vice-president, Adolph Lewisohn, of Lewisohn Bros, treasurer, Charles S. Trench, of Charles S. Trench & Co; members of the board of managers, William H. Davol, of John Davol & Sons; Spencer A. Jennings, of Bruce & Cook; George Nissen, Julius H. Lobdell, of J. H. Lobdell & Co.; L. Nachmann, Clifford B. Hendricks, of Hendricks Brothers; B. Hochschild, of American Metal Company; G. E. Behr, of Behr & Steiner. Arbitration committee—John J. Williams, of John Davol & Sons; Edmund Hendricks of Hendricks Brothers; J. Mitchell Clarke, of Naylor & Co.; T. D. Hazard, Fred. Steiner of Behr & Steiner. Inspectors of election—S. Mendel, C. H. Bolles, Jr., John Deardon. There were 123 votes polled, and the choice was unanimous, there being no opposition.

Copper.—The market continues dull and quiet, but a slightly better tendency has been noticeable, and there is evidently more strength underneath than is apparent on the surface. There is certainly very little cheap copper to be had, and producers resist all efforts to quote lower prices, evidently believing in the future of the article. The larger lake companies are not in the market, but some of the smaller companies, together with second hands, might sell small quantities somewhat below 11c., which may to-day be called the nominal price. For electrolytic copper, we have to quote for cakes, wire bars or ingots 10%, and cathodes 10%, while the price for casting copper must be reduced to 10%. Some transactions in Arizona pig copper took place, but the prices were not reported. In the main, little business has been done for home trade, and for comparatively small quantities. The exports for last month show the unprecedentedly large figure of 10,843 tons of 2,240 lbs., and yet, in spite of these heavy shipments, the statistical position of the article in Europe shows a further improvement of 1,101 tons for the second half of March, which proves conclusively that nearly all the copper which has been shipped has gone direct to consumers. All reports from Europe agree that consumption of copper there is exceptionally heavy, and if there has also been a lull in the demand, it is said to be due to flat reports received from this side.

Fine copper continues to be scarce in Europe. The g. m. b. market was somewhat irregular, and opened at £44 10s. for spot, but became stiffer during the week, and closes at the best, £45 @ £45 2s. 6d. for spot and £45 5s. @ £45 7s. 6d. for three months prompt. For refined and manufactured we quote: English tough, £48 10s. @ £49; best selected, £50 @ £50 5s.; strong sheets, £55 @ £55 10s.; India sheets, £53 @ £53 5s.; yellow metal, 4 1/2 d. Large government orders have of late been given out in England as well as in France.

Chilean Copper Market.—Messrs. Jackson Brothers write as follows from Valparaiso, under date of February 29th: Following the advance of prices in Europe, our sales for the past fortnight have again been on a large scale, amounting to 21,164 quintals for deliveries up to the end of May. We quote for bar copper, f. o. b. coast port, \$57.07 (Chilean) per metric quintal; for regulus, 50%, f. o. b., \$24.19 per metric quintal; for copper ores, 10%, f. o. b., \$3 16 per metric quintal.

Tin has not shown much life, nor quotations much alteration, although they are a trifle higher. We quote for spot and April 13 40, and May to July 13 40. The arrivals of late have been small.

The English market is steady at £60 5s @ £60 7s. 6d. for spot and £60 17s. 6d. @ £61 for three months, while the statistics for the month of March again show an increase of 1,300 tons, and stocks everywhere are rather heavy. Under the circumstances, prices are well maintained.

The tin statistics for March, as compiled by the New York Metal Exchange, show total shipments for the month of 2,805 tons from the Straits and 300 tons from Australia. The deliveries for the month were: London, 1,600 tons; Holland, 836 tons; United States (excluding Pacific ports), 1,300 tons; total, 3,736 tons. The stocks on hand at the close of the month were as follows, in tons of 2,240 lbs:

	Store.	Afloat.	Total.
London	16,796	2,175	12,941
Holland, Barca and Billiton	5,204	933	6,137
Straits	1,400	498	1,898
U. S., ex. Pacific ports	3,053	1,810	4,863
Total	26,423	5,416	31,839

The total stock above given on April 1st shows an increase of 268 tons over that reported on March 1st.

Lead.—There has been little inclination on the part of consumers to take much material, and a desire to sell on the part of Western producers being noticeable, prices have declined to 3'05 @ 3'07 1/2, with one or two small transactions a trifle lower. It is reported that the production of soft Missouri lead has considerably increased, and consumption is not quite as good as was expected.

The foreign market has declined to £11 @ £11 1s. 3d. for Spanish and English 5s. higher. The tendency is reported to be flat.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is weak and demoralized. The latest sales were made on a basis of 2'75, East St. Louis. The demand is extremely light.

Spelter.—Although quiet, prices have been fairly

well maintained, and are only a trifle lower than last week, viz., 4'17 1/2 @ 4'22 1/2.

The London market remains firm, good ordinary brands being quoted £15 10s., and specials 2s. 6d. more.

Antimony is quiet and dull; no change in prices.

Nickel.—Demand is more active, and some large orders are on the market. Makers are very firm in their ideas, and it is impossible to place orders below the prices given. We quote 35 1/2 @ 38c. per lb. for small orders, and 34 @ 35c. for ton lots. The London price is 13 1/2 @ 15d. per lb.

Platinum.—Prices are steady and unchanged, and we quote \$13 @ \$14.50 per oz. New York. London quotations are 49 @ 51s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotation, the prices given being respectively for orders of over 250 grams; for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 48c. 49c. and 50c. per gram. Wire and foil are 45c., 46c. and 47c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—Prices are \$37.50 per flask. New York. The London quotations are £8 17s. 6d. per flask; from second hands £8 16s. 3d. @ £8 16s. 6d. is named.

Imports and Exports of Metals.

New York.*	Week, Apr. 1		Year, 1896.	
	Expts.	Impts.	Expts.	Impts.
Aluminum..... lbs.				423
Antimony ore..... short tons				575
" regulus..... casks		50		524
Brass, old..... short tons				59
Chrome ore.....				100
Copper, fine..... long tons	11,843	479	19,597	677
" matte..... "	1346		4,668	11
" ore..... "				1,863
" sulphate..... "		15		15
Iron ore..... "				1,601
" pigs, bars, rods..... "		15		2,275
Iron pyrites..... "				1,700
" sulphate..... "				656
Ferro-mangan'ese..... "				75
Ferro-silicon..... "				1,690
Manganese ore..... "				10,416
Spiegelisen..... "		1,198		
Lead ore..... "				9,924
" pigs and bars..... "	1300	418	9,924	9,800
Nickel..... "				203
Steel, billets, rods..... "		485		8,685
Tin..... "		1400		3,548
Tin and black plates, boxes..... "		14,848		27,303
Zinc (spelter)..... long tons				188
				87

* Metal Exchange Reports. † Week ending April 2.

Baltimore.**	Week, Mar. 27.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, bales, cases				16
Chrome ore..... long tons				509
Copper, fine..... "	1180		6,719	
" matte..... "				500
" sulphate..... "	119		1,159	
Iron, ore..... "		10,545		129,983
" pigs, bars, ingots, blooms..... "				1,247
Iron oxide..... bags				300
" pyrites..... long tons				5,069
Ferro-mangan'ese..... "				1,169
Ferro-silicon..... "		56		58
Limestone..... short "				2,743
Manganese ore..... long "				1,673
Spiegelisen..... "				333
Steel..... "				19
Steel wire, bundles..... "		555		2,202
Tin, long tons..... "		50		80
Tin and black plates, boxes..... "		15,579		68,040
Zinc (spelter)..... long tons				117

** From our special correspondent. † Week ending April 2.

Philadelphia.††	Imports.	
	Week, Mar. 27.	Year, 1896.
Antimony, casks.....		17
Copper ore, long tons.....		4,300
Iron.....	6,100	40,680
" pig.....	120	320
" and steel scrap, long tons.....		618
Manganese ore, long tons.....	124	2,224
Tin.....	30	145
Tin and black plates, boxes.....	9,271	14,375

†† From our special correspondent.

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

Aluminum:	
No. 1, 98% pure rolling ingots, per lb.....	50 @ 55c.
No. 1, " ingots for re-melting, per lb.....	48 @ 53c.
No. 2, 94% pure, ".....	38 @ 42c.
Ingots from scrap, per lb.....	35 @ 40c.
Aluminum-nickel casting metal, per lb.....	40 @ 45c.
Bismuth, per lb.....	\$1.30 @ \$1.75
Phosphorus, per lb.....	50 @ 55c.
Platinum, per oz.....	\$13 @ \$14.50
Tungsten, pure, powder per lb.....	70c.
Tungstic acid, per lb.....	45c.
Ferro-tungsten, 60% in ton lots, per lb.....	60c.

The variations in price are chiefly on size of order.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, April 3.

Heavy Chemicals.—The month opened with great quietude prevailing in this market. Caustic soda is in very light request both for spot goods and for futures. Alkali, while not exactly active, is in better demand than caustic soda and some fair sales are reported. Bleaching powder is dull and somewhat weaker than at the time of our last report. Sal soda has been in fair demand at unchanged prices. We quote: Caustic soda, 2'12 1/2 @ 2'25c. for spot, according to test; carbonated soda ash, 45%, is '35 @ 1c., according to quantities and deliveries. Alkali is 80 @ 95c., according to test and package. Bleaching powder, prime brands, \$1.70 @ \$1.80. Sal soda, 60 @ 65c.

Acids.—Nothing of interest can be reported of this market. The spot demand is light and prices remain unchanged. We quote per 100 lbs. in New York and vicinity, in lots of 50 carboys or over, as follows: Acetic acids (in barrels), \$1.40 @ \$1.70. Muriatic acid, 18', 75 @ 80c.; 20', 80 @ 90c. Nitric acid, 36', \$3.50 @ \$4; 40', \$4 @ \$4.50; 42', \$4.25 @ \$4.75. Oxalic acid, \$7.10 @ \$7.80. Mixed acids, according to mixture. Sulphuric acid, 66', 75 @ 85c.; chamber acid, \$6.50 @ \$7.25 per ton at factory. Blue vitriol, \$3.75 @ \$4, according to size of order.

Brimstone.—We quote for shipments, best unmixed seconds, \$15.25 @ \$15.75. Thirds are 25c. less. Spot or nearby is \$16 for seconds.

Fertilizing Chemicals.—The fertilizer market has been quiet during the past week. A few belated orders are still coming from the South, but business on the whole has been light. Quotations are without marked change from last week, and we quote as follows: Sulphate of ammonia, gas liquor, \$2.40 @ \$2.50; bone, \$2.30 @ \$2.35. Dried blood, high grade, \$1.75 @ \$1.80; low grade, \$1.60 @ 1.70 per unit. Azotine, \$1.80. Concentrated phosphate, 60% available phosphoric acid, 70 @ 71 1/2 c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅, 57c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 90 @ 92c. per unit. Acidulated fish scrap, \$12, and dried scrap with few or no sales, nominally \$21 f. o. b. fish factory. Tankage, high grade, \$19 @ \$20; low grade, \$18 @ \$19. Bone tankage, \$21; ground bone, \$19 @ \$20. Bone meal, \$21 @ \$22.50.

Sulphate of Potash: 90-95%, New York and Boston, \$1.96 1/2; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03 1/2.

Muriate of Potash.—New prices for muriate are: New York and Boston, 1'75c.; Philadelphia, Baltimore and Norfolk, 1'76 1/2c.; New Orleans, 1'78 1/2c., for 80 @ 85% (basis of 80%), in lots 25 tons and upward.

Kalnit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.55 per ton; Norfolk, \$8.90, and New Orleans, \$9.05 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36 1/2c., 37 1/2c. and 38c., [respectively].

Nitrate of Soda.—Spot, \$1.67 1/2 @ \$1.70; future ar rivals, \$1.75 @ \$1.80.

Liverpool. March 25. (Special Report of Joseph P. Brunner & Co.)

There is no improvement to note in the position of chemicals, and business continues very slack.

Soda ash is dull, and little moving outside of deliveries on running contracts. The nominal spot range for tierces is about as follows: Leblanc ash, 48%, £4 @ £4 5s.; 58%, £4 5s. @ £4 10s.; ammonia ash, 48%, £3 2s. 6d. @ £3 10s. per ton; 58%, £3 7s. 6d. @ £3 12s. 6d., all per ton net cash; bags, 5s. per ton less.

Caustic soda is rather easier in tone, although quotations are nominally unchanged. We quote spot range, according to market, as follows: 60%, £6 5s. @ £6 10s.; 70%, £7 5s. @ £7 10s.; 74%, £8 5s. @ £8 10s.; 76%, £9 2s. 6d. @ £9 5s. per ton, net cash.

Bleaching powder is flat, and prices are nominal at about £7 2s. 6d. @ £7 5s. per ton net cash for hard wood packages. Chlorate of potash is steady, at 4 1/2 d. @ 4 3/4 d. per lb., but there is nothing doing. Bicarb. soda in moderate demand, at £6 15s. per ton, less 2 1/2% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia has declined, and is dull at about £8 10s. @ £8 13s. 9d. per ton, less 2 1/2% for good gray, and 24s. for 25% in double bags, f. o. b. here, according to quality. Nitrate of soda is steady at £8 5s. @ £8 7s. 6d. per ton, less 2 1/2% for double bags, f. o. b. here, according to quality. Carb. ammonia, lump, 3 1/2 d.; powdered, 3 1/4 d. per lb., less 2 1/2%.

Valparaiso, Chile. Feb. 29. (Special Report of Jackson Brothers.)

Nitrate of Soda.—The "Combination" had apparently been finally settled when some new difficulties presented themselves in reference to the stocks held by some producers, which could hardly be exported previous to March 31st, 1896; endeavors are being made to overcome them and before closing we may be in a position to state that the project is an accomplished fact. Our market has again been very active in view of improved quotations from Europe, and although prices on this side have not shown any advance of importance, holders are very firm and less inclined to sell at the close. Besides the sales reported below several parcels have changed hands, particulars of which are still kept private. For March sailings guaranteed rates have not

altered, as the freight for ready vessels has risen. We quote March sailing guaranteed at 5s. 2½d.; April, 5s. 6d.; May, 5s. 4½d.; June, 5s. 8d.; July, 5s. 8½d.; August, 5s. 9d.; September-December, 5s. 9½d. The price of 5s. 2½d., with 26s. 9d., all-round freight stands in 4s. 2½d. per cwt. net cost, and freight without purchasing commission. Reported sales are 1,362,000 quintals.

The rates of freight for ready vessels are higher, and we quote for nitrates 27s. per ton to United Kingdom ports; to United States rates are nominal at 25s. to Hampton Roads or order. Forward loadings—after March 31st—are offered at somewhat lower rates.

MINING STOCKS.

Complete quotations will be found on pages 342 and 343 of mining stocks listed and dealt in at:

New York.	Aspen, Colo.	St. Louis.
Boston.	Colorado Springs.	Paris, France.
Philadelphia.	Duluth, Minn.	Mexico.
Baltimore.	Helena, Mont.	Shanghai, China.
Pittsburg.	Salt Lake, Utah.	Valparaiso, Chile.
Denver, Colo.	San Francisco.	London, England.

NEW YORK, Friday Evening, April 3.

The past week, while not active, has seen a somewhat improved inquiry for mining stocks and some advances have taken place in one or two.

Of the Comstocks Consolidated California and Virginia advanced from \$1.00 to \$2.05 with sales of 400 shares. The demand for the other stocks of this group was very light, the only sales being 100 shares of Belcher at 30c., 400 shares of Best & Belcher at 63/65c., 3,100 shares of Comstock Tunnel at 8c., 200 shares of Crown Point at 47/48c.; 200 shares of Hale & Norcross at \$1.10 to \$1.15, 350 shares of Sierra Nevada at 65/75c., 200 shares of Union Consolidated at 60c. and 100 shares of Yellow Jacket at 35c.

Of the California stocks the most active was Brunswick, which shows transactions of 8,500 shares, the price having advanced from 9@13c., owing probably to news of a strike, which is reported to have been made at the mine. Other sales were confined to the Bodie group and consisted of 700 shares of Bodie Consolidated at 25c.; 400 shares of Bulwer at 33/42c.; and 650 shares of Standard Consolidated at \$2 15@2.25.

The Colorado stocks continue the most active, though trading in them was not as lively this week as it has been. Of the Cripple Creek group Victor shows sales of 400 shares of \$6.63 to \$6.75 and Portland of the same number of shares at \$1.30 to \$1.65. The other stocks were lightly dealt in.

Boston. April 2.

(From Our Special Correspondent.)

The market lacks vigor of movement and prices continue to drop. Calumet & Hecla has weakened from \$309½ to \$305. Atlantic went off from \$17 to \$16, but later recovered to \$17½. Franklin fell from \$12 to \$11 and went back to \$12 again. Kearsarge has come out quite freely, selling down from \$11 to \$10. Ocala went off from \$25 to \$24½, up to \$26, and closes at \$25. Quincy sold a point lower at \$124 and later recovered to \$125. Quincy scrip, last week at \$75, is now \$81½, which includes the third installment of \$6½ on the new stock, practically no change. Tamarack dropped from \$96 to \$86, recovered to \$91 and closed at \$85. Tamarack scrip is now full paid and adds 10,000 shares to the stock of the company, making 60,000 in all. Tamarack, Jr., is without sale, nominally \$14. Tecumseh sold at \$3, and Wolverine declined from \$7 to \$6½, and closes \$7.

Boston & Montana declined at first from \$73 to \$72, then rallied briskly to \$77, fell off to \$73½ and closes \$74½. The sales have been usually large, the advanced price bringing out stock freely. This company has declared a quarterly dividend of \$2 per share, payable May 20th. Butte & Boston shows little movement, mainly between \$1½ and \$1¾. Old Dominion further declined from \$15¼ to \$13¾, closing \$14.

The gold stocks present more activity, but at lower figures. All the good stories told about the different properties fail to sustain prices. Boston & Cripple Creek is off from 30c. to 27½c. Gold Coins farther declined from 62½c. to 60c., then rallied sharply to 75c., and closed 72½c. Merced, which broke last week to \$19, went off \$½ to \$18½ next day, then rallied to \$24½, but afterward declined again, closing \$16½. To-day's sales foot up nearly 4,000 shares. Friends of the mine continue to explain the reported shut-down, but the fact comes out that a large number of men have been discharged who were said to be doing outside work not directly connected with the working of the mine. Pioneer advanced from \$8 to \$9½, but fell again to \$8½, with free sales of the stock. Santa Ysabel declined from \$14½ to \$13½ without any special movement. Santa Rosa is naturally without sales under present conditions, but is being worked by the assignee in a small way.

It is understood that an expert will shortly leave here for the mine to make a report as to the most judicious future policy.

Chicago. April 1.

(From Our Special Correspondent.)

The Chicago Mineral and Mining Board has had a good week's business. The following new properties were listed during the week: The Little Gem, the Cosmopolitan, the Lucille, the C. C. Golden Group, the Investor & Prospectors and the Sun Dance. The market closed strong throughout the entire list.

Lions Gold has advanced 1c. and closed firm at

the advanced price. Rhyolite Gold was moderately traded in with prices steady. Sunnyside Gilpin again heads the list in transactions footing up an aggregate of 300,000 shares sold during the week. The closing day of the week saw a sharp advance in this stock, it having jumped from 14½ to 17½c.

The Medina which was called for the first time to-day opened at 6c. This company, in addition to previous holdings, has just bought one-half interest in the Little Darling on Raven Hill, Cripple Creek. Many visitors were present during the past week, admittedly ticket from Colorado, Montana and other mining States.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending April 1st:

Stocks.	Mar. 26	Mar. 27	Mar. 28	Mar. 30	Mar. 31	Apr. 1	Sales.
Boston & C. C.							
Capazone			.02				500
C. C. & C. C.	.03¼	.03¼	.03¾	.03¾	.03¾		32,000
C. C., G. M. B. & L. Co.	.09¼	.09¾	.08¼	.04¼	.08¼	.08¼	104,100
Christmas							21,000
Chi. & G. M.		.03¼	.03¾	.03¾			2,700
Delaware Cf.				.28¾	.29¾		27
Dictator							121,500
Finance	.07¾	.07¼	.07¼	.08¼	.07¼	.07¼	2,900
Golden Stars		.03¼	.03¾				31,700
Gregory Gold.							100
Hawkeye	.21¼	.21¾	.22¼	.22¾	.23	.22¾	75,000
Imperial							34,110
Jefferson					.20		5,500
Justice							
Lyons Gold	.12¾	.12¼	.12¾	.12¼	.12¾	.13¼	75,000
Pharmacist							
Rhyolite	.10¾	.10¾	.10¾	.10¾	.10¾	.10¾	34,110
Sonora	.30	.30¼				.31	5,500
Squaw Mt.							
Sunnyside							
Gilpin	.14¼	.14¼	.14¼	.15¼	.14¼	.18	288,600

Total shares sold, 720,700.

Cleveland, O. April 2.

(From Our Special Correspondent.)

Iron ore stocks are dull. Holders have faith in the properties as a rule and are not disposed to let go at current prices. And the closeness of money is keeping buyers out of the market, so that there are neither buyers nor sellers in any great number. Lake Angeline is sought for to some extent but the sellers keep above the current offers in the main. The transactions in Republic and Lake Superior are few in number and few in shares also. Following are current prices:

Name of Company.	April 2.		
	Par val.	Bid.	Ask.
Aurora	\$25		\$8
Chandler	25	\$12	14
Cleveland-Cliffs Iron Co.	100	43	45
Jackson Iron Co.	25	70	75
Lake Superior Iron Co.	25	30	32
Lake Superior Consolidated	100	21	22
Minnesota Iron Co.	100	69	71
Pittsburg & Lake Angeline	25	80	90
Republic Iron Co.	25	18	20

Colorado Springs, Colo. March 28.

(From Our Special Correspondent.)

The bears have continued to have the upper hand in the mining stock market during the past week. On the whole the trading was unsatisfactory both as to volume and as to prices. The lower priced shares have continued weak. For the higher priced stocks the demand was better and the event of the week was Mollie Gibson, which advanced from 54c. to 81c. owing to reports of a rich strike in the 11th level. It closed at 75c.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending April 2d, as follows:

Name of Company.	Mar. 27	Mar. 28	Mar. 31	Mar. 31	Apr. 1	Apr. 2
Alamo	.07	.07	.06½	.06½	.06	.06
Anaconda	.67	.67	.66	.65	.66	.66
Argentum-Juniata	.62	.63	.63	.61	.64	.63½
Blue Bell	.06	.08	.08	.08	.07	.07
Cripple Creek Con.	.17	.09	.10½	.16½	.16½	.17
Golden Fleece	1.64	.66	1.66	1.65	1.70	1.50
Isabella	.54	.55	.55½	.55	.58	.55
Mollie Gibson	.77	.77	.72	.72	.72	.71
Mount Rosa	.12	.12½	.12½	.12	.12	.11½
Pharmacist	.11	.12	.12	.12	.10½	.11
Portland	1.80	1.75	1.58	1.41	1.51	1.52
Silver State	.01¼	.01¼	.01½	.01½	.01½	.01½
Union	.45	.44	.44½	.45½	.47½	.45½
Work	.14	.14½	.14	.13¾	.13¾	.13¾

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

Name.	Mar. 27	Mar. 28	Mar. 30	Mar. 31	April 1	April 2
Bankers	.17½	.17	.16½	.15	.15½	...
Des Moines	.08	.08	.08	.08	.07	...
Gold & Globes	.22	.23	.23½	.22	.23	...
Gold Standard	.09½	.09½	.09½	.09	.09	...
I-abella	.54½	.55	.56	.56½	.58	...
Jefferson	.22½	.23	.23	.23	.21½	...
Keystone	.07	.07	.08¼	.07	.06	...

Helena Mont. March 26.

(From Our Special Correspondent.)

The principal feature of the past week was the sale of 50,000 shares of Iron Mountain stock. Last week 35,000 shares were sold. This stock was all

held as collateral. The company has just declared its 30th dividend. The condition of the mine is good, the ore being richer as depth is attained. The dividends were reduced to 1c. per share monthly in order to create a fund to drive a long tunnel over 6,000 ft. from the mine to the mill, which is a good business operation, but is taken advantage of by some parties to "bear" the stock.

Laramie, Wyo. March 27.

(From Our Special Correspondent.)

The Laramie Mining and Stock Exchange last week accepted the resignation of Mr. C. E. Denig as secretary, and tendered the position to Col. E. P. Snow, who has accepted the offer. In addition to his duties as secretary of the Exchange, Colonel Snow will visit the various mining camps from time to time. Mr. M. N. Grant, president of the Exchange, has published a statement in which he says: When requested to do so, the Laramie Exchange will send Mr. Snow to any county in the State to examine and write up its mines, to assist in preparing a prospectus, or to in any other way aid in an honest effort to induce capital to take hold and develop mineral resources. We shall use every means in our power to aid in the development of the mineral resources of every county in Wyoming.

Salt Lake City, Utah. March 28.

(Special report of James A. Pollock.)

The general market closes with an upward tendency, but business is somewhat restricted and it is difficult to anticipate the course of the market.

Ajax had no material change, little business being done in the stock. Alliance remained inactive. The last assessment has been very generally paid. Gas has levied an assessment of 2c. per share, and as a result the stock declined several points. Anchor was even stronger than during the previous week, bidding being more active and offerings at considerably advanced prices.

Bogan was in more demand, even with the assessment delinquent. Bullion-Beck advanced, closing stronger than for several weeks past. Stockholders feel confident that the usual 25c. dividend will be paid next month, as the property is reported to be in good shape and the shipments of ore continued as heavy as formerly.

The Centennial-Eureka has practically suspended ore shipments during the pendency of the option, which runs to July, the operations at the properties consisting almost entirely of development work, which is daily showing up greater and richer ore bodies than ever. The assessment on Dalton was practically all paid, the number of delinquent shares being comparatively small. The stock was in more demand than during the previous week, prices remaining about stationary. Daly showed good strength, and there was no stock to be had at the previous week's figures. Daly-West also showed increased strength, bidding being active and prices advancing. Dalton & Lark will declare its monthly dividend on the first of the coming month. The management announces that the amount paid will not be less than in March, when it was ½c. per share, and there may be an increase.

Geyser was only fairly active, sales being made at slightly advanced figures. The mill continues work regularly and the reports of the company are all very good. There was a slightly increased inquiry for Horn Silver, despite the expected passing of the regular quarterly dividend. Lucky Bill is reported to have encountered a very favorable change in the formation at the bottom of its shaft and the stock made a good advance. Little Pittsburg rallied materially and even with the assessment practically delinquent sold at higher figures than during the previous week. Mammoth continued strong and made slight advances in price. The improvements in the mine and mill equipments have not yet been made. Morgan (Meeers) was inactive. Mercur sold at somewhat lower figures early in the week, due to the effort of several holders to realize on a quiet market. The stock showed increased vigor toward the end of the week and regained some of its lost strength. Everything at the properties is in the very best of shape with increased shipments of product being made. Ontario will pay 10c. per share on the 20th. The stock was very strong above \$13. Silver King has announced its regular dividend of 25c. per share, payable on the 7th of April. The stock sold as high as \$15.50 with little offered.

Sunshine did considerable business at about the previous week's figures. The insiders are still maintaining their usual silence, but they refuse to sell any stock at figures away above the market.

Tetro is reported to have found the vein for which it was driving, but no inside information is being given out. The tunnel is out of lime and into quartz. Utah and Galena were in demand. Eagle was one of the active stocks of the week, advancing from 10c. to 25c. in less than 10 days. The properties are in the Camp Floyd District above the Rover and are said to have a future.

San Francisco. March 28.

(From Our Special Correspondent.)

There were some signs of activity this week, but they soon subsided and the market must again be reported as dull. The fact is that it is left almost entirely to the small operators, whose limit is very narrow. The bigger people are doing nothing at present, and the outside public cannot be induced to take any interest in the fluctuations of the Comstock shares. In the mines themselves there is nothing new, and even the Brunswick lode operations have ceased to cause remark.

Some quotations at the close to-day are: Consoli-

dated California & Virginia, \$1.60@\$1.65; Ophir, \$1.20; Hale & Norcross, \$1.15; Confidence, 92@94c.; Occidental, 87@88c.; Sierra Nevada, 68c.; Yellow Jacket, 39@41c. Of the Bodies, Mono is quoted at 12c. and Bodie Consolidated, 28@29c. A sale of 100 shares of Eureka Drift at 50c. is noted.

The Hale & Norcross business continues to be much discussed. Superintendent Tangerman has made no attempt to return and is now in this city, as are the other officers of the company. The mine remains closed, and the managers have given no indication of their intentions as to the future.

The feeling at Virginia City seems to be that the next move of the company will be against the Miners' Union, and the managers of that body evidently fear that an attempt to reduce the rate of wages may be followed up by other companies.

Contradictory reports come from Mariposa about the Merced mine. On the one hand it is said that the so-called shut-down was simply the discharge of men who were engaged in preliminary and development work, and that mining will continue; on the other it is reported that the force is being reduced still further, and that the results so far are disappointing. The truth cannot be determined at present.

A good many men have been here lately from the East, on their way to examine gold mining properties in the State. These mines, if taken up, will probably be listed on some of the Eastern exchanges, as the prospective owners reside there. Boston parties seem to be particularly interested.

THE NEW EXCHANGE.

Business has continued steadily at the Gold Mining Exchange of San Francisco, and the total sales for the week foot up some 40,000 shares of stock. Some quotations noted are: Kennedy, \$12.50@\$13.50; Champion, \$12.50@\$13; Amalie, \$2.25; Thorpe, 91@93c.; Grant, 42@45c.; Savannah, 32c. It is understood that more stocks will be listed after the formal opening.

A special executive meeting of the Exchange was held at its rooms in the Mills Building, March 26th, at 2 o'clock. Messrs. W. E. Rodgers, J. C. Bauer, William Berg, A. Gerberding, H. Shainwald, W. W. Gollin, J. H. Tingman and J. L. Bradbury were unanimously elected members of the Exchange. A number of other applications for membership having been received, it was decided to amend the constitution so as to extend the list to 60 members, thereby admitting 10 new members at \$250 each. It was also concluded to have the formal opening of the Exchange on Monday, April 6th, and a special committee of arrangements was appointed, consisting of ex-Governor Daggett, Messrs. W. R. Smedberg, A. Gerberding, E. C. Godfrey and A. S. Wollberg.

British Columbia.

(From Our Special Correspondent.)

VANCOUVER, March 25.

Some 35 of the principal men in Vancouver have formed a mining exchange for the purpose of trying, as far as possible, to eliminate the foisting of worthless properties on the outside and foreign public. By the by-laws of the exchange no property can be listed unless it is known to be a bona fide undertaking; and as the most of the members are interested in mines in almost every section, it will be hard for any "wildcat" mine to get listed. It is expected to open the exchange in a small way at first some time in April, and, as the properties are listed and business increases, the scope of the undertaking will be extended. Very little has been done as yet in mining stock trading, but the members have thought it best to begin at once.

London. March 21.

Business in the South African mining market has been irregular. The output of the Rand for February, 167,018 oz., was considered satisfactory under the circumstances, as disproving the exaggerated rumors about scarcity of labor. These figures are only slightly below those of February of last year. Some of the mines showed a very considerable increase.

The West Australian section has been dull. The reports sent by Mr. Raymond to the Harquahala Company on its West Australian property are attracting some attention. They are the first really truthful reports sent to England, and reflect great credit on Mr. Raymond. It is not necessary to quote them; it is sufficient to say that he reports what he sees, and gives his own opinions, instead of sending the stereotyped reports which promoters require from experts.

New Zealand mines are very active and new issues are continually coming out. The prospect of a boom in these mines strengthens every day.

In the American section there is nothing to report either in the way of business on the Stock Exchange or in new floatations.

The condition of mining in Cornwall continues to occupy the serious attention of Cornishmen and capitalists. Carn Brea and Tinroft mines will probably continue working and will be acquired by a limited liability company, following the example of Dolcoath. Two of the royalty owners are going to put money into the company. This is the more remarkable as it will be the first occasion on which the royalty owners have ever put a penny into the industry which has in the past yielded them such handsome fortunes.

Paris. March 22.

(From Our Special Correspondent.)

It has been rather a heavy week in our stock markets here, more because people are uncertain,

and are waiting to see what may happen, than because the disposition to speculate is wanting.

The South African gold stocks have been quiet, and with little change. There is still a great deal of criticism of the Johannesburg mine managers who have meddled in Transvaal politics, and there is much talk among French stockholders of enforcing changes, though it does not yet appear very clearly how it is to be done. A concerted movement will not be easy to arrange.

Most of the copper stocks continue firm, and prices are good, in spite of a reaction in Rio Tintos, due, it is said, to heavy selling orders from Berlin. This has not affected the other stocks to any extent, and some of them have even risen.

Huanchaca (silver) is again lower; the extent of the trouble caused by the influx of hot water in the mine is uncertain, but the reports continue very unfavorable.

The nitrate shares have gained ground on the assumption that the companies have finally concluded a convention under which production will be regulated and prices maintained. The opposite is the case with the shares of the zinc companies, which will, I believe, continue their present competition.

The imports and exports of gold in France for the two months to the end of February are reported by the Ministry of Commerce as follows:

	1895.	1896.
Imports.....	109,018,642	51,011,121
Exports.....	7,684,544	47,168,854
Excess, imports.....	101,334,098	3,842,267

Our French chambers of commerce are not to be permitted to meet in conference to discuss questions of common interest. For more than 10 years they have agitated for this right and the bill to reform the legislation on chambers of commerce, now before the Senate, does not contain any clause conceding such a right. Recently M. Poirier, who was formerly President of the Paris Chamber of Commerce, proposed an amendment to permit chambers to meet in conference. The Reporter on the bill opposed the amendment on the ground that an assembly of chambers of commerce would constitute an economic parliament that would impose, or attempt to impose, its views on the legislature, and would be influenced by particular rather than by general interests. This amendment was rejected by a large majority, and the chambers of commerce will be able, as heretofore, to co-operate only through correspondence.

I think you understand that these chambers of commerce are not free associations like yours, but official bodies, whose members are appointed by the government from among the merchants and manufacturers of each city. Their powers are very closely regulated by law, and they can take action only under government supervision.

The strongest and most active section of the market is found in the shares of the metallurgical companies. Nearly all of them have been largely dealt in, and show gains in prices, in contrast with the depression which has affected them for a year past. The general belief seems to be that the iron and steel trades are recovering from the depression caused by light demand, sharp competition and low prices, and that more prosperous times may be expected.

As we are considering the metallurgical stocks, it will be of interest to give you the statistics which have just been announced by the Comite de Forges de France for the year 1895. That statement gives the total production of pig iron for two years past, in tons:

	1894	1895.
Forge iron.....	\$1,000,113	\$1,516,168
Foundry iron.....	469,604	489,721
Total.....	\$2,069,714	\$2,005,889

The forge iron includes that which is intended for the manufacture of steel. Of the total in 1895 there were 8,180 tons made with charcoal, the rest with coke or coal.

The same authority gives the production of wrought iron for two years past as follows, in tons:

	1894.	1895.
Bars.....	\$685,319	\$654,645
Rails.....	684	427
Plates.....	99,778	88,599
Total.....	\$785,781	\$743,671

The making of iron rails is, as you see, almost a lost art with us. Our total for steel last year was 716,931 tons, of which 693,290 tons were Bessemer and open-hearth steel and 23,641 tons were crucible, blister and other special steels. The totals are given below:

	1894.	1895.
Bars, shapes, etc..	\$310,116	\$395,168
Rails.....	182,510	160,417
Plates.....	151,564	170,346
Total.....	\$743,671	\$743,671

The increase of 42,741 tons over 1894 in steel was almost the same as the decrease in wrought iron, which was 42,110 tons. This shows how steel is replacing iron.

I may add also that the total production of coal in France has been, in tons:

	1894.	1895.
Coal.....	26,964,125	27,801,246
Lignite.....	452,780	434,763
Total.....	27,416,905	28,236,039

The total gain last year over 1894 was 819,334 tons, 3% almost exactly.

Our iron trade shows at present a continued advance in methods, and a close attention to economy in working and the best utilization of materials which promise well for its future. We cannot compete with you in the quantity of our products, but we hope to excel in quality and cost. AZOTE.

MEETINGS.

Name of Co.	Location of office.	Date.	Time.
Bozeman.....	Bozeman, Mont.....	April 6	7:30 p. m.
Central.....	11 William St., New York, N. Y.	" 6	12 m.
Champion.....	Crocker Building, San Francisco, Cal.	" 14	2 p. m.
Cleveland.....	Walker Bros. Bank Bldg., Salt Lake City, Utah...	" 11	12 m.
Colo. C. & I. Co.	Pueblo, Colo.....	" 6	" "
Comanche.....	J. F. Forbis, Butte City, Mont..	" 18	" "
Copper King.....	503 Mining Exchange Bldg., Denver, Colo.	" 16	10 a. m.
Polaris.....	1 Broadway, New York, N. Y.	" 15	3 p. m.
Potosi.....	51 West Park St., Butte, Mont.	" 15	7 p. m.
Rodondo.....	5 Jacobson Building, Denver, Colo.	May 2	4 " "
San Pedro.....	53 E. Prospect St., Cleveland, O.	" 16	" "
Ybarra (Gold) ..	132 Market St., San Francisco, Cal.	" 21	8 p. m.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Divq.	Sale.	Amt.
Belcher.....	Nev.....	52	Apr. 7	Apr. 28	.25
Brunswick Con.	Cal.....	10	Mar. 23	" 22	.03
Bullion.....	Nev.....	47	Apr. 22	May 14	.10
Con. Cal. & Va.	"	6	" 8	Apr. 28	.30
Gold Bar Con..	Utah...	3	Mar. 19	" 10	.05
Golden Sand...	"	1	" 16	" 7	.01
*Gould & Curry	Nev.....	78	Apr. 28	May 20	.15
Lady Emma....	Cal.....	6	" "	Apr. 27	.15
Leo.....	Mont...	9	Mar. 18	" 9	.0014
Little Pittsburg	Utah...	2	" 28	" 8	.014
*Lucky Hill....	"	18	Apr. 18	May 9	.02
Marguerite.....	Cal.....	2	" 1	Apr. 30	.10
Morning Star...	Nev.....	11	Mar. 13	" 14	.0046
No. Banner Con.	Cal.....	38	" 31	" 22	.03
Oseola Con.....	"	5	" 14	" 8	.01
*Paxman.....	Utah...	1	Apr. 18	May 2	.02
Silver King.....	Cal.....	13	Mar. 9	Apr. 6	.25
Thorpe.....	"	1	Apr. 20	May 15	.05

*New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Dividends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
*Aetna Con.....			\$10,000	\$50,000
Alaska-Mexican			16,200	119,031
Alaska Treadwell			75,000	2,750,000
Boston & Mont...	May 20	\$300,000	600,000	4,025,000
*Bullion Beck & Ch			65,000	2,015,000
*Calumet & Hecla			500,000	43,850,000
*Centennial-Eureka			150,000	1,650,000
*C. O. D.....			5,000	25,000
*Dalton & Lark			12,500	12,500
Dominion Coal...			600,000	
*Florence.....			10,818	45,976
*Galena.....			3,000	18,000
*Gold Coin.....			30,000	45,000
*Golden Fleece ..			54,000	455,179
Gold & Globe Hill			15,000	24,375
Hecla Con.....			30,000	2,130,000
Hickland.....			25,000	3,109,918
*Homestake.....			93,735	5,775,500
Horn Silver.....			50,000	5,130,000
*Isabella.....			45,000	67,500
*Le Roi.....			25,000	10,000
*Mercur.....			75,000	425,000
Minnesota Iron...	Apr. 15	247,500	247,500	2,392,500
*Mont. Ore Pur. Co.	" "	4,000	160,000	320,000
Moose.....			6,000	186,000
Napa Con.....	Apr. 1	10,000	30,000	770,000
*Ontario.....			45,000	13,220,000
Oseola Con.....			75,000	2,022,500
*Ollaqueachy....			1,000	1,000
Portland.....			60,000	683,000
Quincy.....	Apr. 17	200,000	40,000	8,070,000
*Small Hopes....			2,000	
*Silver King.....	Apr. 2	37,500	150,000	600,000
Smuggler-Union			500,000	1,640,000
*Utah.....			5,000	137,100
*Victor.....			60,000	525,000
*Victor M. & L....			9,000	38,000
Totals.....			\$835,000	\$4,238,768

* March dividend paid.

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

STOCK QUOTATIONS.

Table with columns for Boston, Mass. and New York. Includes company names, locations, par values, and stock prices for various dates from Mar. 27 to April 3.

INDUSTRIAL COAL AND COAL RAILROAD.

Table listing industrial coal and coal railroad companies with columns for par value, stock prices, and sales data.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing company names, par values, and prices.

ST. LOUIS, MO., STOCKS.

Table of stock quotations for St. Louis, Mo., including company names and prices.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing company names and prices.

BALTIMORE, MD.

Table of stock quotations for Baltimore, Md., including company names and prices.

MISCELLANEOUS SECURITIES.

Table of miscellaneous securities including American Coal, Canteauy Ore, and other companies.

LONDON.

March 21.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like Americans, Alaska, Idaho, Montana, Colorado, Nevada, California, etc.

PARIS.

Week ending March 20.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices. Lists companies like Acieries de Creusot, France, Spain, etc.

MEXICO.

Week ending Mar. 26.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices. Lists companies like Amistad y Concordia, Guanajuato, Hidalgo, etc.

VALPARAISO, CHILE.

Fortnight, Feb. 29.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices. Lists companies like Arturo Prat, Caracoles, Decub. de Huantajaya, etc.

SHANGHAI, CHINA.

Feb. 21.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu Mg. & Trad., Funjong Mg. Co., etc.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par val., Mar. 23, Mar. 24, Mar. 25, Mar. 26, Mar. 27, Mar. 28, Sales. Lists companies like Addie C., Agate, Alamo, etc.

PHILADELPHIA, PA.

Table with columns: NAME OF COMPANY, Location, Par Val, March 26, March 27, March 28, March 30, March 31, April 1, Sales. Lists companies like Acety. L.H. & P., Bethlehem Iron, etc.

SALT LAKE CITY, UTAH.

Week ending Mar. 28.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price, Name of Company, Par value, Bid, Asked, Actual selling price. Lists companies like Ajax, Alliance, Anchor, etc.

PITTSBURG, PA.

Week ending April 1.

Table with columns: NAME OF COMPANY, Location, Par val, Bid, Ask, Selling price, NAME OF COMPANY, Location, Par val, Bid, Ask, Selling price. Lists companies like Mansfield, N.Y. & C. Gas Co., etc.

HELENA, MONT.

Week ending Mar. 28.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, Date. Lists companies like Am. Dev. & M. Co., Bald Butte, etc.

DULUTH, MINN.

Week ending Mar. 28.

Table with columns: NAME OF COMPANY, Location, Company's Office, Par value, Bid, Asked. Lists companies like Adams Iron, Biwabik Mt. Iron, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Assessments. Lists 130 mining companies with their respective financial details.

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

CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills
 Bostelmann, Louis F.
 Bullock, M. C., Mfg. Co.
 Furligh Rock Drill Co.
 Clayton Air Compressor Works.
 Fraser & Chalmers.
 Ingersoll-Sergeant Drill Co.
 (See Diamond Drills)
Aluminum Bronze
 Fairbanks Co.
Amalgamators
 Bucyrus Steam Shovel & Dredge Co.
 Fraser & Chalmers.
Amalgam Plates
 Western Plating and Mfg. Co.
Anti-Friction Metals
 Besley, Chas. H. & Co.
 Chester Steel Cast. Co.
Architects and Builders
 Berlin Iron Bridge Co.
 Pittsburg Bridge Co.
 Pollock, Wm. B. & Co.
Assayers' and Chemists' Supplies
 Ainsworth, Wm.
 Baker & Adamson.
 Baker, C. O.
 Becker, Christian.
 Bullock & Crenshaw.
 Denver Fire Clay Co.
 Elmer & Amend.
 Henry Hill Chem. Co.
 Scaife, Wm. B. & Sons
 Shiffer Bridge Co.
 Walker Mfg. Co.
 Penn Sm. & Ref. Wks.
 Penna. Salt Mfg. Co.
 Roessler & Hasselacher
 Chemical Co.
 Sargent, E. H. & Co.
 Solvay Process Co.
 Taylor, John, & Co.
 Troemner Henry.
 Western Chemical Co.

Copper Dealers and Producers.
 American Metal Co.
 Arizona Copper Co.
 Atlantic Mining Co.
 Balbach S. & Ref. Co.
 Baltimore Cop. Wks.
 Bath, H. & Son
 Boston & Mont Mfg. Co.
 Bridgeport Copper Co.
 Butte & Boston Mfg. Co.
 Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Copper Works.
 Elliott's Metal Co., Ltd.
Corrugated Iron
 Berlin Iron Bridge Co.
 Besley, Chas. H. & Co.
Crucibles, Graphite, Etc.
 Dixon, Jos. Crucible Co. & Machine Works.
Damper Regulators
 D'Ester & Seelye.
Cyanide.
 Roessler & Hasselacher Chemical Co.
Diamonds
 Bishop, Victor, & Co.
 Bostelmann, L. F.
 Lexow, Theodor.
Diamond Drills
 Bishop, Victor, & Co.
 Bostelmann, L. F.
 Bullock & Crenshaw.
 Lexow, Theodor.
 Sullivan Machinery Co.
 (See Air Compressors and Rock Drills)
Draughtsmen
 Young, Wm. R.
Drawing Materials
 Besley, Chas. H. & Co.
 Dietzgen, S. & Co.
 (See Engineering Instruments.)
Dredges
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Souther & Co.
Dryers
 Brown, Horace T.
 (Ummer, F. D. & Son Co.
 Denver Eng. Wks. Co.
Dump Cars
 Denver Eng. Wks. Co.
 Hendrie & Bolthoff Mfg. Co.
Educational Institutions
 Arizona School of Mines.
 Chicago School of Assaying.
 Correspondence School of Mines.
 Lehigh University.
 Mass. Inst. of Technology
 Michigan Mining School.
Electrical Batteries
 Macbeth, James, & Co.
Electrical Machinery and Supplies
 Besley, Chas. H. & Co.
 Card Electric Co.
 Denver Eng. Wks. Co.
 General Electric Co.
 Jeffrey Mfg. Co.
Elevators, Conveyors, and Hoisting Machinery
 Brown Hoist & Conv. Mach. Co.
 Caldwell, H. W., & Co.
 California Wire Wks.
 Cooper, Hewitt & Co.
 Crook, W. A., & Bros. Co.
 Denver Eng. Wks. Co.
 Field & Goetzman.
 (See Wire Rope Tramway and Machinery.)
Emery Wheels
 Besley, Chas. H. & Co.
 New York Belting & Packing Co., Ltd.
Engineers, Chemists, Metallurgists
 See Directory Pages 4, 5 and 6.
Engineers' Instruments and Supplies
 Buff & Berger.
 Bullock & Crenshaw.
 Dietzgen, S. & Co.
 Fauth & Co.
 Gurley, W. & L. E.
Engines
 Buckeye Engine Co.
 Bullock, M. C. Mfg. Co.
 Dayton Gas Engine & Mfg. Co.
 E. Terpinie Boiler Co.
 Elliott, Wm., & Son.
 Fraser & Chalmers.
 Lidgerwood Mfg. Co.
 Philadelphia Eng. & Mfg. Co.
Excavators
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Souther & Co.
 Vulcan Iron Works.
Fire-Brick and Clay
 Chur, A. T.
 Denver Fire Clay Co.
Furnaces
 Brown, Horace.
 Hoskins, Wm. (See Machinery.)
Fuses, Powder
 Ingersoll-Sergeant Drill Co.
Fuse, Safety
 Climax Fuse Co.
Gas Engines
 Dayton Gas Engine & Mfg. Co.
 Norman, J. J., & Co.
Gas Works
 Pollock, Wm. B. & Sons.
 Wood, E. D. & Co.
Gauges, Recording, Etc.
 Bristol Mfg. Co.
Gearing
 Besley, Chas. H. & Co. | Denver Eng. Wks. Co.
 Chester Steel Cast. Co. | Fraser & Chalmers.
 (See Machinery.)
Grease, Graphite, Etc.
 Besley, Chas. H. & Co. | Dixon, Jos. Cruc. Co.
Harv. ysed Steel
 Pierce & Miller Engineering Co.
Heavy Machinery
 Denver Eng. Works Co.
 Fraser & Chalmers.
Hose, Rubber, Etc.
 New York Belting & Packing Co., Ltd.
Injectors
 Penberthy Injector Co.
Insulated Wires and Cables
 Okonite Co., Ltd. The
Insurance Companies
 Hartford Steam Boiler Inspect'n and Ins. Co.
 Mutual Life Insurance Co.
Joint Fittings
 Tight Joint Co.
Lead Linings for Chlorination Tubs.
 Raymond Lead Co.
Locomotives
 General Electric Co.

Hunt, C. W. Co.
 Porter, H. K. & Co.
Machinery.
Dealers in Mining, Milling and Other Machinery
 Allis, Edw. P., & Co.
 Bacon, E. C.
 B. & C. Mfg. Co.
 Besley, Chas. H. & Co.
 Blake, T. A.
 Bostelmann, L. F.
 Boston Ore Machinery Co.
 Bradley Pulverizer Co.
 Buckeye Engine Co.
 Bull. Ck. W. C. Mfg. Co.
 Caldwell, H. W., & Co.
 Card Electric Co.
 Carver Electric Co.
 Channon, H. Co.
 Colorado Iron Works.
 Connorsville Flower Co.
 Crandall & Huff.
 Crook, W. A., & Bros. Co.
 Davis-Coby Ore R. Co.
 Denver Eng. Wks. Co.
 Ellison, Wm., & Son.
 Engelbach Mach. Mfg. Co.
 Field & Goetzman.
 Fraser & Chalmers.
 Hammond, Mfg. Co.
 Hendrie & Bolthoff Mfg. Co.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Jessop, W., & Sons, Ltd.
Manganese Steel
 Taylor Iron & Steel Co.
Metal Dealers
 American Metal Co.
 Am. Zinc-Lead Co.
 Baker & Co.
 Bath, Henry & Son.
 Besley, Chas. H. & Co.
 Bridgeport Copper Co.
 Elliott's Metal Co., Ltd.
 Eureka Co.
 Foster, Blackett & Wilson.
 James & Shakespeare
 Johnson, Matthey & Co.
 Lambert's Wharf. Co.
 Lewisohn Bros.
Metallurgical Works and Ore Purchasing Processes
 Amer. Zinc Lead Co.
 Baker & Co.
 Balbach Sm. & Ref. Co.
 Baltimore Copper Co.
 Bridgeport Copper Co.
 Canadian Copper Co.
 Denver Eng. Wks. Co.
 Elliott's Metal Co., Ltd.
 Foster, Blackett & Wilson.
 Fraser & Chalmers.
 General Gold Extraction Co.
 Kendall Gold & Silver Extraction Co.
Miner Tools
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Hendrie & Bolthoff Mfg. Co.
 Hunt, C. W. Co.
 Sheffield Car Co.
 (See Machinery.)
Mine, Mill and Smelters Supplies.
 Carpenter, Geo. B. & Co.
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Gates Iron Works.
 Park's & Wilkinson.
 Roessler & Hasselacher Chemical Co.
 Stieren, Willis H. (See Machinery.)
Mining and Lumber Companies
 Atlantic Mfg. Co.
 Arizona Copper Co.
 Arizona Mfg. Co.
 Butte & Boston Mfg. Co.
 Clark Land & Mines Co.
 Copper Queen Mfg. Co.
 Canadian Copper Co.
Ore Crushers
 Brown, Horace F.
 Cumm. r. F. D., & Sons Co.
 Davis-Coby Ore Roaster Co.
Ore-Trusting Works
 Hunt, F. F.
 Ledoux & Co.
 Montana Ore Purchasing Co.
Packing and Pipe Coverings
 Braudt, Randolph.
 Jenkins, R. H.
 Hine & Robertson.
Phosphor Bronze Smelting Co.
 Ricketts & Banks.
 Robertson, W. F.
 State Ore Sampling Co.
Pile Drivers
 Bucyrus Steam Shovel and Dredge Co.
 Ingersoll-Sergeant Drill Co.
Pipes
 Pollock, Wm. B. & Co. | Wyckoff, A., & Sons,
Platinum
 Baker & Co.
 Johnson, Matthey & Co.
Powder
 Atlantic Dynamite Co.
 T. & C. Powder Co.
 Ingersoll-Sergeant Drill Co.
Pressure Blowers
 Connorsville Flower Co.
Pressurized Regulators
 D'Ester & Seelye. (Curtis.)
Printers
 American Fertilizer.
 Arms & Explosives.
 Australian Mfg. Stand.
 Bullionist.
 Colliery Guardian.
 Denver Republican.
 Economic Miner.
 El Minerio Mexicano.
 Electrical Miner.
 Electrical Industry.
Pumps
 Blake, Geo. F. Mfg. Co.
 Calhoun, A. S., & Co.
 Pump Works.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Gouda Mfg. Co.
 Hooker Steam Pump Works.
 Jeannette Iron & Steel Works.
 Smith-Valle Co.
 Tod, Wm., & Co.
 Worthington, Henr.)

Quarrying Machines
 Bostelmann, L. F.
 Ingersoll-Sergeant Drill Co.
 Rand Drill Co.
 Sullivan Machinery Co.
Quicksilver
 Eureka Co.
Railroads
 C. R. & Quincy R. R.
 Denver & Rio Grande R. R.
 Denver, Leadville & Gunnison Ry.
 Florence & Cripple Creek R. R.
 Midland R. R. of Kentucky.
 Rio Grande Southern R. R.
 U. P., D. & G. R. R.
Railroad Supplies and Equipment
 Carpenter, Geo. B. & Co. | Hunt, C. W. Co.
 Channon, J. Co. | Porter, H. K. & Co.
 Crandall & Huff. | Robinson & Orr.
 Fairbanks Co. | (See Machinery.)
Regulators, Damper, Heat, Etc.
 D'Ester & Seelye Co.
 Eddy Valve Co.
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Return Steam Traps
 D'Ester & Seelye. (Curtis.)
Rock Drills. (See Air Compressor.)
Roading
 Berlin Iron Bridge Co. | Scaife, Wm. B. & Sons
 Pneapolis, Dodge & Co. | Shiffer Bridge Co.
 Pittsburg Bridge Co.
Rubber Goods
 New York Belting & Packing Co., Ltd.
Seales
 Fairbanks Co.
Screens
 Atcherson, R., Perf. Metal Co.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Harrington & King Perforating Co.
 Link Belt Machinery Co.
 Ludlow-Saylor Wire Co. (See Machinery.)
Second Hand Machinery
 Robinson & Orr.
Separators
 D'Ester & Seelye Co.
Shoes and Dies
 Chester Steel Cast. Co. | Fraser & Chalmers
 Cromie Steel Works. | Pierce & Miller Engi
 Crossen Steel Co. | neering Co.
 Denver Eng. Wks. Co.
Shovels (Steam)
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Souther & Co.
Smelting and Refining Works
 Balbach S. & Ref. Co. | Orford Copper Co.
 Baltimore Cop'r Wks. | Penna. Salt Mfg. Co.
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 Elliott's Metal Co., Ltd. | Refining Works.
 East City Sm. & Ref. Co. | Phos. & Sulf. Brnse
 Mathison Smelting Co. | Smelt. Co.
Steam Traps.
 D'Ester & Seelye. (Curtis.)
Steel Rails, Castings, Rolls, Drill Steel
 Bethlehem Iron Co. | Pierce & Miller Engi
 Carpenter Steel Co. | neering Co.
 Chester Steel Cast. Co. | Robinson & Orr.
 Crandall & Huff. | (See Metal) Dealers.
 Crandall & Huff. | Pollock, Wm. L. & Co.
 Crescent Steel Co. | Scaife, Wm. B. & Sons
 Garrison, A. Fdry. Co. | Taylor Iron & Steel Co
 Moore, S. L., & Sons Co.
Tanks
 Denver Eng. Wks. Co. | Jessop Wm. & Sons
 Gates Iron Works. | Ltd.
 Walker Mfg. Co.
 Williams Mfg. Co.
Telegraph Wires and Cables
 Okonite Co., Ltd., The.
Temperature Regulators
 D'Ester & Seelye. (Curtis.)
Testing Laboratories
 Fairbanks Co.
Tubs
 Besley, Chas. H. & Co.
 Pratt & Whitney Co.
Tubes
 Besley Chas. H. & Co. | Pollock, Wm. L. & Co.
 Williams Bros.
Tabling-Rubber
 New York Belting and Packing Co., Ltd.
Turbine Water-Wheels
 Stillwell-Bierce & Smith-Valle Co.
Typewriters.
 Wyckoff, Seamans & Benedict.
Valves
 D'Ester & Seelye Co. | Fairbanks Co.
 Eddy Valve Co. | Jenamans Bros.
Ventilators
 Bullock, M. C. Mfg. Co. | Tod, Wm., & Co.
 Fraser & Chalmers.
Valuante Emery Wheels
 New York Belting and Packing Co., Ltd.
Water-Wheels
 Girard Water Wheel Co.
 Lefel, James, & Co.
 Stillwell-Bierce & Smith-Valle Co.
Well Drilling Machinery
 Bostelmann, L. F.
 Sullivan Machinery Co.
 Williams Bros.
Wharfage
 Lambert's Wharfage Co.
Wheels, Car
 Chester Steel Cast. Co.
 Taylor Iron & Steel Co.
White Lead
 Foster, Blackett & Co.
Wire Cloth
 Atcherson, R., Perf. Metal Co.
 Barnum, E. T.
 Harrington & King Perforating Co.
Wire Rope & Wire
 Besley, Chas. H. & Co.
 Broderick & Bascom
 Rope Co.
 California Wire Wks.
 Carpenter, G. B. & Co.
 Carper Steel Co.
 Channon, H. Co.
 Cooper Hewitt & Co.
 Hunt, C. W. Co.
 Leschen, A., & Sons
 Philadelphia
 R. B. Dodge & Co.
 R. B. Dodge & Co.
 Roofways Syndicate.
 Trenton Iron Co.
 Hunt, C. W. Co.
 Roebbing, J. A., Son
 & Co.
 Hopeways Synd. Lt.
 Vulcan Iron Works.
 Fraser & Chalmers.

advertisin out in the wrong direction—missed the Engineering and Mining Journal.

POSITIONS VACANT.

FREE ADVERTISING

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

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

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

1439 WANTED - A PRACTICAL MECHANIC, to have charge of large hoisting and compressing machinery, and also supervise machine shop at an iron ore mine in Michigan. Must be a draftsman. Address A., ENGINEERING AND MINING JOURNAL.

1440 WANTED - GRADUATE OF TECHNICAL school as assayer and assistant to the manager of gold mine in Oregon. No practical knowledge required. Salary to start with, \$75 a month; will increase soon if services are satisfactory. Address R. R., ENGINEERING AND MINING JOURNAL.

1441 WANTED - ASSAYER AND METALLURGICAL chemist wanted as assistant in private assay laboratory in Chicago; must be able to give instruction to students in such branches and make himself generally useful. Really competent men only need answer. Give full details as to age, experience, ability and salary expected, which must be moderate. Address ASSISTANT, ENGINEERING AND MINING JOURNAL.

1442 WANTED - A MAN THOROUGHLY familiar with brass and copper sheet rolling, and capable of making a detailed report upon the same. Address SHEET BRASS, ENGINEERING AND MINING JOURNAL.

1443 WANTED - A CHEMIST, PRACTICALLY familiar with the manufacture of fine medicinal chemicals. One who has been, or is employed in one of the large plants of this sort, preferred. A good opportunity for a young man to show his ability. Address Z., ENGINEERING AND MINING JOURNAL.

1444 WANTED - YOUNG MAN, GRADUATE in chemistry, possessing high-grade technical ability and originality, for position in new electro-chemical industry. One residing in or near New York City preferred. Give references and particulars. Address ELECTRO-CHEMISTRY, ENGINEERING AND MINING JOURNAL.

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

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

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

1450 CHEMIST WANTED FOR A VIRGINIA Furnace Works. Must work very accurate and be able to give proof of his ability. A good position for a good man. Address E. J. S., ENGINEERING AND MINING JOURNAL.

1451 WANTED - A REVERBERATORY furnace foreman, one who understands the Welsh methods of copper smelting and refining to go to the West. Address, COPPER BOTTOMS, ENGINEERING AND MINING JOURNAL.

1452 WANTED - AN ACTIVE, AMBITIOUS, young Mining Engineer to act as Assistant in California, British Columbia, and perhaps South Africa. Good recommendations required. Address, ACTIVE, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

MINING AND MECHANICAL ENGINEER, who has made a speciality of the construction and operation of cyanide and chlorination mills, thoroughly familiar with best modern practice, will accept position as superintendent of works, or with large mining machinery manufacturers, where such knowledge will be of advantage, can bring full line of plans and details. First-class references. Address C. and C., 206 Boston Building, Denver, Colo. No. 17,382, April 11.

MINING ENGINEER - GRADUATED FROM Columbia School of Mines, would like position of assistant to superintendent, in charge of mines or reduction works. Address L. H. B., ENGINEERING AND MINING JOURNAL. No. 17,377, April 11.

POSITION WANTED - BY AN EXPERIENCED young chemist and assayer. Graduate of a well-known technical school, and has managed a commercial analytical laboratory. Can give all references. Address S. A. E., ENGINEERING AND MINING JOURNAL. No. 17,383, April 11.

MINING ENGINEER (AGE 25) DESIRES engagement as assistant manager, chemist, assayer, or other suitable employment with mine or smelter after May 1st. Expert accountant. Address, P., ENGINEERING AND MINING JOURNAL. No. 17,385, April 25.

A YOUNG MAN WITH SEVEN YEARS' experience in Spanish America would like a position as timekeeper, assistant bookkeeper, and interpreter in a mining camp in Mexico, Central or South America. Has had commercial experience. Was assistant general manager in a silver camp and is an excellent man to deal with Mexicans. Best of references from mining people. Correspondence solicited. Address, AMERICAN, ENGINEERING AND MINING JOURNAL. No. 17,387, April 11.

CHEMICAL ENGINEER AND MANAGER, American, with long and successful experience as above with large manufacturing concerns, will shortly be disengaged. Is a technical graduate and has an excellent record as a pushing organizer, developer and manager of manufacturing processes. Good executive and mechanical ability. Excellent references. Address A. X., ENGINEERING AND MINING JOURNAL. No. 17,389, May 2.

WANTED - POSITION AS MINING SUPERINTENDENT or mill-man; nine years' experience; amalgamation or concentration. Address F. K. S., 38 So. Grant Ave., Denver, Colo. No. 17,378, April 11.

COMPETENT ASSAYER DESIRES SITUATION, Graduate Missouri School of Mines, '87. Can take charge of sampling works or assist mine manager. Address O. L., Denver office ENGINEERING AND MINING JOURNAL, 206 Boston Building, Denver, Colo. No. 17,386, April 25.

EXPERIENCED COPPER METALLURGIST is open for engagement. Economic manager, and well posted in all latest improvements. Speaks Spanish fluently and would go to Mexico. Best references. Address COBRE, ENGINEERING AND MINING JOURNAL. No. 17,380, April 18.

WANTED - POSITION AS MANAGER OF gold mine or assayer. British Columbia preferred. Best of references. Address H. K. WALTON, Box 407, Central City, Colo. No. 17,384, April 18.

A COMPETENT SUPERINTENDENT OF fertilizers and acid works, desiring a change of location, would like to correspond with some manufacturer wanting such service. Best references. Address PHOSPHATE, ENGINEERING AND MINING JOURNAL. No. 17,390, May 2.

WANTED - ANY CLERICAL POSITION of trust at a mine. Not a miner. Locality immaterial; highest references; age 25; single; English. Address TRUSTWORTHY, ENGINEERING AND MINING JOURNAL. No. 17,391, April 11.

Contracts Open.

NOTICE TO CONTRACTORS.

THE ENGLEWOOD SEWERAGE COMPANY OF ENGLEWOOD, N. J., will receive Sealed Proposals until April 24th, 1896, for the construction of an outlet sewer, eighteen (18") inches in diameter.

About 1,000 linear feet to be of cast iron pipe and about 2,500 linear feet to be of stone ware pipe.

Plans may be examined and specifications obtained at the office of J. H. Serviss, C. E., in Englewood, and specifications may be obtained from the undersigned at 135 Broadway, New York.

Proposals should be endorsed "Proposal for Outlet Sewer."

The Company reserves the right to reject all bids. THE ENGLEWOOD SEWERAGE CO., by R. H. ROCHESTER, President.

April 6, 1896.

TREASURY DEPARTMENT, Office, Supervising Architect, Washington, D. C., April 3d, 1896.

Sealed proposals will be received at this office until 2 o'clock, p. m., on the first day of May, 1896, and opened immediately thereafter, for all the labor and materials required for the interior finish of the U. S. Court House, Post Office and Custom House at Sioux City, Ia., in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Sioux City, Ia. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Interior Finish of the U. S. Court House, Post Office and Custom House at Sioux City, Ia.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

WATER-WORKS. - Sealed proposals will be received by the Town Board of Sullivan, Ind., until April 16th, 1896, for the construction of a complete system of water-works, including pumping plant, stand pipe, filter, dam, six miles of 12 to 4 in. pipe, 40 hydrants. Each proposal must be sealed and addressed to the Clerk of the Board and must be accompanied by a certified check equal to 5% of the amount bid, made payable to Fred Hoke. The Town Board reserves the right to reject any and all bids. Maps, plans and specifications may be seen and examined at the office of the Town Clerk, or at office of Engineer at Indianapolis, to whom all inquiries may be addressed. Wake Giles, President, Fred Hoke, Clerk, JOHN J. HAINSWORTH, Engineer, 66 Ingalls Building, Indianapolis.

WATER-WORKS. - Sealed proposals will be received by the Mayor and City Council of Eufaula, Ala., until April 23d, 1896, for constructing a system of water-works, and for furnishing the materials for the same. Works will embrace approximately 10 1/4 miles of pipe, stand-pipe, and other appurtenances. Plans and specifications will be on file, and may be seen at the office of the City Clerk, and copies of specifications, forms, etc., may be obtained from the City Clerk after March 20th, 1896.

PIPE SEWERS. - Sealed proposals will be received by the Mayor and City Council of Eufaula, Ala., until April 23, 1896, for constructing pipe sewers and for furnishing sewer pipe (separate bids). Extent of proposed work is 7 1/2 miles of pipe sewers from six (6) to eighteen (18) inches in diameter. Plans and specifications will be on file at the office of the City Clerk, and copies of specifications, forms, etc., may be obtained from the City Clerk, after March 20, 1896.

PUMPING ENGINE. - Office Board of Trustees of Water-Works, Sandusky, O. - Sealed proposals will be received at the office of this Board, in the city of Sandusky, O., until the 1st day of May, 1896, for remodeling a 3,000,000-gal. pumping engine now in the pumping station of the water-works of said city, according to specifications therefor, which are on file in the office of said Board. All proposals must be on blanks which may be obtained at the office of the said Board. Each bid must be accompanied by a certified check, drawn to the order of the Secretary of said Water-Works, in the sum of \$300, as surety that if the bid is accepted a contract will be entered into. The right is reserved to reject any or all bids. P. J. CROSKEN, President; ADAM KOLB, C. O. DEHNEL, Trustees; C. A. JUDSON, Superintendent.

WATER-WORKS. - Notice is hereby given that the Village Council of the Village of Hector, Minn., will construct a system of water-works for the supplying of water for public and private use in said village and will let the contract for the construction of the same to the lowest responsible bidder.

All bids for the construction of said system of water-works must be received by the Village Recorder of said village until April 15, 1896.

Said system of water-works will be constructed in accordance with the plans and specifications for the same now on file in the office of the Village Recorder of said village. The Village Council of said village hereby reserves the right to reject any and all bids. JAMES CHAPMAN, Village Recorder.

BRIDGE. - Bids will be received at my office in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me, at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Polaski County, Ga.

BRIDGE. - Bids will be received at my office, in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Polaski County, Ga.

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By FRIDOLIN REISER, Director of the Cast Steel Works of Bohler Bros. & Co., at Kapfenberg. SECOND REVISED EDITION. Large Octavo, 125 pages, 1896, paper. Price, 75 Cents.

MEETINGS.

VICTOR GOLD MINING COMPANY, OF Cripple Creek, Colo. DIVIDEND NO. 36.

Has declared a dividend (No. 36) of TEN CENTS A SHARE on its capital stock (200,000 shares) amounting to \$20,000, payable April 15th, 1896. Hooks close at New York office, 61 Broadway, April 9; open April 16th, 1896. Total dividends to date, \$345,000. H. A. KIRKHAM, Transfer Agent.

CONTRACTS OPEN.

Continued from Page 18.

TREASURY DEPARTMENT, office Supervising Architect, Washington, D. C., April 9th, 1896.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 5th day of May, 1896, and opened immediately thereafter, for all labor and material required for the roof covering, skylight, drain pipes, etc., for the U. S. Post Office, Court House and Custom House building at Milwaukee, Wis., in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Milwaukee, Wis. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid, should it be deemed in the interest of the Government to do so. All proposals received after the time stated for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for Roof Covering, Skylight, Drain Pipes, etc., for the U. S. Post Office, Court House and Custom House, Milwaukee, Wis.," and addressed to WM. MARTIN AITKIN, Supervising Architect, Orig.

DREDGING.—U. S. Engineer Office, 39 Whitehall street, New York.—Sealed proposals for dredging in Housatonic River, Conn., will be received here until April 27th, 1896. Information furnished on application. H. M. ADAMS, Major Engineers.

BRIDGE.—Office Commissioners of Roads and Revenues, Fulton County, Georgia, Atlanta, Ga.—Sealed proposals will be received at this office until the 6th day of May, 1896, for furnishing all material and labor and building complete, ready for use, the Bridge over Peachtree Creek on Peachtree road, about five miles from the City of Atlanta, in accordance with plans and specifications prepared by Grant Wilkins, Engineer, copies of which can be had by bidders upon application to the undersigned or to the Engineer. Each bid must be accompanied by a certified check for the sum of Two Hundred and Fifty Dollars, payable to C. A. Collier, Chairman Commissioners of Roads and Revenues of Fulton County. The right is reserved to reject any or all bids. All proposals to be addressed to the undersigned, and must be made upon the blank form for proposal attached to the specifications. ANTON L. KONTZ, Clerk Commissioners Roads and Revenues for Fulton County, Atlanta, Ga.

MISCELLANEOUS WANTS.

WANTED.

Monazite; also other Thorium ores. Address, with price and quantity, F. B. K., ENGINEERING AND MINING JOURNAL.

Received Too Late for Classification.

A COMPETENT ASSAYER AND CHEMIST of high grade technical school desires a position in a steel furnace or mine laboratory. Best of references and recommendations can be furnished. Has had practical experience. Address M. M. S., ENGINEERING AND MINING JOURNAL. No. 17,394, April 25.

METALLURGIST AND MINING ENGINEER open for engagement. Specialties, successful operation of mines and metallurgical plants, development of properties, erection of plants and management for dividends. Address MODERN METHODS, ENGINEERING AND MINING JOURNAL. No. 17,392, April 18.

POSITION WANTED AS ASSAYER AND assistant by young graduate who is at present employed in Colorado gold mine. Considerable practical experience, and has studied abroad. Can survey, keep books and is familiar with cyanide process. Speaks French and some Spanish. Best of references. Address I. S., ENGINEERING AND MINING JOURNAL. No. 17,393, May 2.

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

SAVILLE, MACLYMONT & CO., Mining and Consulting Engineers and Metallurgists, 10 Annie Street, San Francisco. Examine and Report on Mines, Ore Bodies and all Metallurgical Processes connected therewith.

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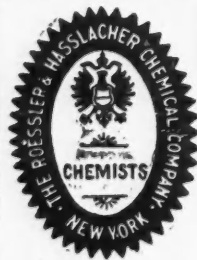
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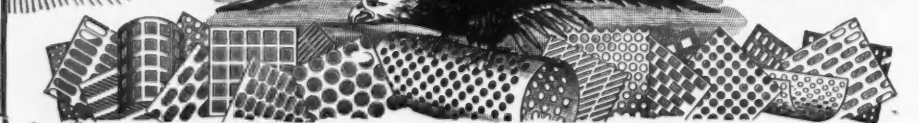
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