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THE excellent portrait of the late FREDERIC A. POTTS, which we published last week, was from a plate engraved for Harper's Weekly, and the use of which was courteously given us by Messrs. HARPER & BROS., of this city.

THE ENGINEERING AND MINING JOURNAL is printing from an exceedingly fine steel plate a portrait of the late Mr. F. A. POTTS, with a notice of his life. We shall be pleased to hear from those who desire a souvenir of the most popular member the coal trade of this city ever possessed. Only a small number of those beautiful portraits will be printed, and they will be presented to the friends of the ENGINEERING AND MINING JOURNAL.

THE Argentine Republic has been providing itself liberally in the matter of railroads of late, as is indeed in harmony with its largely increased population from immigration, and the rapidly growing prosperity of the country. The government, by the last advices, have apparently

determined to remedy the one drawback to the full development of agriculture in certain sections, and especially in the Province of Buenos Ayres, the most populous of all the settled districts, viz., the want of water. The loss of crops and stock from drought has been from time to time very serious, and a project has been prepared by two engineers, MM. LAVALLE and MECHER, for an extensive system of irrigation canals, which, it is believed, will be carried out either by the government direct, or by means of a government guarantee of interest on the capital required for the work. This is a subject which in former times, even among the aborigines of South America, was well understood and appreciated, but until recently has been rather neglected in modern days, and we are now witnessing a general awakening to and recognition of its importance.

STATE INSURANCE OF WORKMEN IN GERMANY.

From the English Foreign Office Report on this subject, we gather the following interesting data and figures. The scheme, when complete, will embrace compulsory insurance against sickness as well as accident; so far, however, it has only been extended to the latter. The report just issued sums up the result of the operations of the Imperial Insurance Bureau for the year 1886, and we learn that the number of persons insured was 3,725,000 and the premiums paid amounted to \$3,095,000, being based on the wages received by each workman. The premiums are contributed by the employers according to the number of employes engaged and the nature of their occupation, being a higher or lower percentage according to the risk involved. The management is divided between the State authorities, representatives of the employers, and those of the workmen, and subdivided into numerous committees and arbitration courts to decide upon the claims.

The payments for accidents amounted to \$425,000, and for administration to \$580,000; \$70,000 were paid for expenses outside of ordinary management, and a reserve was commenced by laying by \$1,350,000. The number of accidents for which claims were allowed was 100,159, of which 2716 were fatal, and in respect of which relatives to the number of 5935 received relief. From this it would appear that putting the compensation in these cases at a very moderate figure, the other accidents must have been for the most part very slight, entailing very little interruption to work, or the scale of compensation must be very low. The apparently undue proportion of the administration expenses is explained by the fact that being the first full year of the operation of the law, the costs of initiating the system were much heavier than the ordinary expenditure under this head will be in future.

REPORT OF THE ENGLISH CURRENCY COMMISSION ON BI-METALLISM.

The composition of the Royal Commission appointed to inquire into the reasons for the depreciation of silver, and to report for or against its rehabilitation by means of some bi-metallic device, was such that it would have been against nature to expect anything approaching a unanimous decision. On the one side were ranged some of the most confirmed mono-metallists, and on the other some of the most ardent and earnest advocates of bi-metallism. It was not likely that either the one party or the other would effect or undergo a conversion, so that really all we gain from the inquiry is to learn to what lengths the bi-metallists are ready to go in their recommendations, and what are the small concessions or remedies suggested by the mono-metallists to appreciate the price of silver.

Let us see upon what points the Commissioners are agreed, with the knowledge that six of them have pronounced distinctly against bi-metallism, while an equal number advocate its adoption. Part I, of the Report consists of 60 pages, and sets forth in an able and impartial manner an analysis of the subject of the inquiry, and the evidence and arguments laid before the Commission. This portion of the report is so complete that it will well repay the study of any one desiring to form a sound opinion on the questions involved, and it is much to be regretted that with such ample data to go upon the Commissioners were unable to arrive at a more conclusive decision. The result arrived at, signed by all the members of the Commission, is in their own words as follows: "To sum up our conclusions on this part of the case, we are of the opinion that the true explanation of the phenomena which we are directed to investigate is to be found in a combination of causes, and cannot be attributed to any one cause alone. The action of the Latin Union in 1873 broke the link between silver and gold which had kept the price of the former, as measured by the latter, constant at about the legal ratio; and when this link was broken the silver market was open to the influence of all the factors which go to affect the price of a commodity. These factors happen since 1873 to have operated in the direction of a fall in the gold price of that metal." In Part II, the mono-metallists led as we may say (for he is the most prominent) by Lord HERSCHELL, admit that the fall in

the price of silver, and the consequent fluctuations of exchange, are an impediment to trade, but they point to the fact that in spite of this drawback there has been an enormous expansion of commerce between England and the silver-using countries, and in fact that it has increased more rapidly than the trade with countries in which the gold standard is maintained. In regard to the price of commodities in such countries evidence is adduced to show that in some cases values have fallen greatly in price while in others they have risen. The argument is, therefore, that the silver question has not affected these prices, but other causes, such as improved means of communication, etc., have.

With regard to a remedy, they admit that the only one is the opening of the mints of all the great nations to free coinage of gold and silver at a certain fixed value, and they then proceed to give their reasons against such action.

The matter is one of such great interest and importance to this country, and especially to the silver mining industry, to which we especially address ourselves, that for a full consideration of the facts we reprint in another column *in extenso* the arguments of the mono-metallists and those in favor of bi-metallism.

The mono-metallists make two suggestions to alleviate the evil, viz.: that the duty on silver plate should be abolished, and that England should negotiate with other nations for the more extended use of silver for currency purposes.

Four out of the six, including Lord HERSCHELL and Mr. FREMANTLE, the Master of the Mint, recommend an issue of ten and twenty-shilling notes, based upon silver.

The bi-metallists, without adducing much evidence, contend in Part III., that the fluctuations in the price of silver have seriously injured trade, and that the objections to their cure for the evil are untenable.

We find that this part of the Report is signed also by Mr. SAMUEL MONTAGU, M. P., a banker who has made the subject of exchange and monetary questions generally, a life-long study, and who is esteemed one of the most clear-headed and practical money dealers in London. This gentleman, however, recommends a ratio of 20 to 1 in place of the formerly accepted standard of 15½ to 1.

THE FATE OF THE PANAMA CANAL.

When we last referred in our issue of August 25th to this subject, M. DE LESSEPS was attempting to inspire his followers with grand words, the unmeaning folly of which we pointed out at the time. The shareholders and the world in general were then assured, that the lottery bonds recently offered for subscription, but which the public did not take, were disposed of in some mysterious way to certain bankers, and by this means all the financial difficulties of the enterprise were removed, so that nothing remained but to finish the work on the canal.

Shortly after the date referred to it became clear that no such financial arrangement had been consummated, and that the small amount raised from the public would quickly be absorbed in paying the interest charges on previous issues of bonds, to pay prizes on the lottery drawn bonds and to make payments on the scandalous Eiffel contract for the construction of the canal locks, or perhaps it would not be far amiss to say for the construction of the Eiffel tower at Paris. For M. EIFFEL had not yet done any work on the locks, but he had, within three months of signing the contract, received from the company no less than \$800,000, with which it is more than surmised the Eiffel tower enterprise was saved from collapse.

This extraordinary and disgraceful contract between M. DE LESSEPS for the canal company and M. EIFFEL was in substance as follows:

M. EIFFEL engages to finish all the work by June 30th, 1890. The penalty for failure to deliver the locks within the agreed time is a fine of \$20,000 per month for each month's delay. If during the progress of the work the company's representative considers there is inexcusable delay, after due notice to M. EIFFEL, the contract may be cancelled by the company without incurring liability to M. EIFFEL.

M. EIFFEL is allowed in all, outside the contract price proper for the work to be done, for tools, plant, freight, etc., \$6,640,000, and the amount of the whole contract will amount to about \$30,000,000. For this important engagement M. EIFFEL deposits the sum of \$200,000—but in what form? Forty thousand dollars in cash, which he had previously received from the company, as upon signing the contract he was entitled to a payment of \$40,000. In addition he had to deposit \$160,000 in non-negotiable bills signed by himself; but within three months or so of the signing of the contract by its terms M. EIFFEL had already received \$800,000, without any work done and with hardly a pretense of a show of work.

The one-sidedness of such a contract is apparent on the face of it, and it would be hardly too severe a criticism to designate it a fraud and a breach of trust on the part of the Panama Direction. When it became evident that the treasury would soon be empty, the administration of the company engineered a sham outside movement to open another sub-

scription for the unplaced bonds, and as a bait announced an extra lottery drawing in which the holders of the bonds sold were to participate, the company surrendering the prizes it had already won at the previous drawing on the unsold bonds in the Treasury. Committees were formed all over the country with a great flourish of trumpets, M. DE LESSEPS and his son went on a stumping tour, addressing in the chief cities the existing bondholders and those whom they hoped to induce to join in the disastrous enterprise, and the original proposition was that no subscription was to be valid unless the whole amount was subscribed. But few days were required to show that this was a hopeless task, and the conditions were speedily changed to the subscription of 200,000 bonds, in place of 1,140,000. Even now the result of all these efforts has fallen short of this diminished goal, and by the last advices, on the authority of the *Economiste Francaise*, the number subscribed is less than 100,000, though not a word is heard of releasing the conditional subscribers, and we fancy that, no matter how few they may be, they will be held to their subscription, and a little more money be thus brought into the depleted coffers of the moribund concern.

However this may be, the end of the work at Panama by the existing company is near at hand, within measurable distance one may say, and the question what will be the fate of the Panama Canal will soon be pressed for an answer? What will be the effect of the utter collapse, and loss of interest and principle, of this gigantic undertaking representing about \$420,000,000 of capital, held almost entirely in France? At first sight such a fearful loss of capital would seem to entail with it, not only a national disaster, but perhaps a very severe financial convulsion that would react on the money market in the rest of the world.

Owing to the fact that this capital has been contributed in small amounts, and by an enormous number of individuals, spread over the whole country, it may be that the impending collapse will not bring about a great financial crisis, as has been predicted; many individual cases of suffering and hardship will, of course, occur from the sweeping away of the accumulations of hard-earned savings, but the losers will for the most part be comparatively poor people, who are now working for their living, and will continue to do so with fewer comforts now, and with gloomy prospects for their old age. It is a sad enough picture to contemplate, but it is not probable that any important financial house or institution in France will be seriously involved. The class that has followed M. DE LESSEPS so blindly in his Quixotic or foolhardy career is the same class that provided out of "old stocking hoards" the German indemnity of \$1,000,000,000, which was paid without apparent effort, and such portion of which as was provided temporarily by the banks and rich part of the community, was speedily transferred by sale to the saving class in the provinces.

What will become of the work when abandoned by the company from necessity? In the first place, it seems to us out of the question that the French Government should step in and undertake the responsibility, as was at one time rather generally assumed, and incur the interest burden involved in completing the task. The public debt of France now amounts to about \$6,000,000,000, the interest on which alone, with the other heavy expenses of the government, is already more than the tax-bearing capacity of the nation can well meet: and we do not believe that there is any statesman in France who would dare to propose so foolish a remedy for the mistakes of an enthusiastic and vain old man. Nor do we believe that there is any combination of capitalists in Europe or in this country who would take the canal as it stands as a gift, with the obligation of completing it even in its modified form, and for this reason we do not look for any reconstruction of the company and continuation of the work. It has, apparently, no other future than to remain in its unfinished condition, as a monument to the folly of ill-considered engineering work in the nineteenth century, and the project may perhaps be resuscitated and carried out some centuries hence under conditions more propitious than those now existing, exactly as the canal now being completed across the Isthmus of Corinth was commenced and abandoned centuries ago.

Since writing the foregoing two additions have been made to the literature or history of this subject. The first of these appeared in the *Evening Post* of the 21st in the shape of a balance sheet of the undertaking, which seems to us to be fairly and even favorably stated for the company, and is principally based on official figures. The result of this shows the concern to be absolutely bankrupt without taking into account the completion of the canal. Its present liabilities exceed its assets by at least \$42,000,000, and if M. DE LESSEPS were to succeed in selling all the unplaced bonds we have referred to, he would only have enough money in the treasury to discharge these liabilities and pay interest and expenses up to the end of 1889, without having anything for work on the canal.

The special correspondent of the *Times* of this city yesterday cabled the not wholly unexpected news that the financial scandal arising out of the affairs of the company is hourly growing in intensity, and that now a former employé has in a circular letter addressed to all the Deputies charged two ex-ministers of Public Works and fully fifty members of the

Chamber with having received bribes in connection with the passage of M. DE LESSEPS' lottery loan. This is a heavy blow, and hurries on the end.

THE FUTURE OF THE ANTHRACITE TRADE AND THE WASTE IN MINING.

The shipments of anthracite coal in Pennsylvania apparently still continue to increase. In our issue of September 22d we called attention to the output for August, 4,097,563 gross tons, as the heaviest month's work in the history of the trade, yet we now learn from the official report of the statistician of the trade that in October, which was expected to show a reduced shipment, no less than 4,187,527 tons were sent to market, and the stock of coal at tide-water shipping ports decreased 11,678 tons, showing that deliveries to dealers and consumers amounted to nearly 4,200,000 tons. By adding six per cent to the shipments to cover coal used at the mines, we find that the total production of anthracite in October was apparently about 4,440,000 tons, and that the mines have now a capacity of about 53,000,000 tons a year. As they had shipped in the first ten months of the year 31,723,143 tons, shipments during the year promise to exceed 38,000,000 tons.

It is true there is not a little incredulity expressed concerning the figures of shipment of more than one of the companies, and it is plainly hinted at that they are exaggerated in order to form the basis for a "quota" when the trade requires each of the companies to work at less than its full capacity. We cannot say how much truth there may be in these rumors, but the condition to which the undoubtedly enormous shipments are rapidly bringing the trade is one in which such tricks and subterfuges will be wholly unnecessary as they are now contemptible.

The consumption of anthracite is increasing far more rapidly than the growth in population; including the coal consumed at the mines it will amount this year to six tenths of a gross ton per capita of the population of the country, a rate which is just about double that in 1860, or, in other words, the per capita increase in consumption in the past 28 years has averaged fully $\frac{1}{10}$ ton per annum, or $\frac{1}{8}$ ton every ten years. The population of the country is increasing at an average rate of about 3 per cent a year, and is now estimated at nearly 63,000,000 persons. If this rate of increase should continue the home consumption of anthracite five years hence, or in 1893, would amount to about 47,000,000 and the exports would bring the total to 50,000,000 tons, and in 1898 this would no doubt exceed 60,000,000. It is true, of course, that the rate of increase may vary in the future from what it has been in the past, but the lowering of transportation rates constantly widens the markets, and will for some time to come continue to do so, so that it is not unreasonable to assume that during the next ten years the per capita consumption will be maintained if not increased, and it follows that within fifteen or at most twenty years the maximum annual production of anthracite will have been reached at, let us say, 70,000,000 tons.

Within ten or fifteen years this fact will have become so apparent to those controlling the trade that all competition will have ceased, and the prices will be regulated as they have been this year, by "sympathetic movement," and will be limited only by the cost of competing fuels.

It would be very rash to conclude from this that the prices will greatly increase, even under the very probable hypothesis that the bituminous coals which can reach tide-water economically should be controlled by some "trust" or "sympathetic" arrangement, for science has in store many surprises that may prove more powerful than "combinations" or "corners," and the law may also be invoked to regulate the price of necessities within reasonable limits. The most important lessons which these facts now teach are:

1st. That for solvent companies no such strife for tonnage and cutting of prices is necessary, as in the past has brought nearly all the coal producers to the verge of bankruptcy and even pushed some over the brink.

2d. The value of anthracite coal is now sufficiently demonstrated to make the present disgraceful waste in mining as wholly inexcusable as it is unnecessary and avoidable.

The letter of Mr. HEBER S. THOMPSON, the accomplished engineer of the city of Philadelphia coal lands, and that of Mr. P. W. SHEAFER, the well-known mining engineer of Pottsville, Pa., which were published in the ENGINEERING AND MINING JOURNAL October 27th and November 3d, strongly emphasized the importance of this subject. The great companies that own nearly the entire anthracite fields have not, however, so far as we know, ever made any serious effort to adopt a better system of mining, and the only amelioration proposed is to rob pillars closer and to run back into the mine a portion of the coal already wasted and now disfiguring the coal districts as "mountains of culm."

The problem must be attacked in a different manner, and an entire change in the system of mining can alone effect a satisfactory solution of it. Coal is far too valuable a material to be used as supports for the roof of the mine, and the cry that any system of working out the whole of the coal would prove very expensive, is wholly unwarranted. There

is sufficient experience available to justify the statement that nearly the whole of the present enormous waste of anthracite in mining can be avoided without increasing cost to the companies, taking account of all the elements of cost, many of which are not included in the pay-roll at the mines.

CORRESPONDENCE.

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

Does Carbonate of Baryta Exist in Workable Deposits in the United States?

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I have occasion to use in manufacture considerable quantities of carbonate of baryta, which at present is imported from England, and I write to ask you if you can inform me of any workable deposits in this country.

MANUFACTURER.

[Witherite, or carbonate of baryta, according to Dana, is found near Lexington, Ky., but we have no doubt it has since been discovered in many localities, though we are unable to specify them. Such of our readers as have any information on the subject will please communicate with us. The present supply comes chiefly from Fallowfield, in Northumberland, England, and is used in the manufacture of plate-glass, and in making beet-sugar.—ED. E. AND M. J.]

THE COPPER SYNDICATE'S CONTRACTS.

For every one interested in the production and consumption of this metal, as well as the position of the different copper mines all over the world, the following semi-official data about the contracts entered into by the Sociétés des Métaux may prove very useful. We give the figures without any further comment, says Money, and only wish to draw the attention of our readers to the fact that the different agreements involve an annual liability for the Copper Syndicate of fully twelve millions sterling.

NAME OF COMPANY.	Annual production in tons as agreed.	Duration of contract.	Price of cop- per per ton.		Approximate liability of Syndicate in 1,000,000 omitted.	General remarks.
			Yrs.	£ s.		
Rio Tinto.....	25,000	3, till Dec. 31, '90	65	85	1,625	Guaranteed by Comptoir d'Escompte, with option for further 3 years.
Tharsis.....	11,700	3, " " "	65	85	790.5	
Mason & Barry.....	7,000	3, " " "	65	85	455	
Bratsberg.....	400	3, " " "	65	85	26	
Vignaes.....	1,100	3, " " "	65	85	71.5	
Panulcillo.....	3,000	3, " " "	65	85	195	
Cape Copper....	5,750	3, " " "	70	85	402.5	
Namaqua Co..	{ 1,768 in 1888 2,240 in 1889 2,720 in 1890 }	3, " " "	63	15	143	Less cost of smelting, 49 10s. per ton.
Quebrada Co....	4,320	3, " " "	70	85	302	Minus actual expenses for smelting. The smelting of this ore is done by the Comptoir d'Escompte for account of the Syndicate.
Tilt Cove.....	4,650	3, " " "	70	85	325.5	
Bett's Cove.....	1,200	3, " " "	70	85	84	
Calumet-Hecla.	22,320	3, " " "	61	10	1,373	Share-half in profit over contract price.
Quincy.....	4,400	3, " " "	61	10	270	
Tamarack.....	7,440	3, " " "	61	10	457.5	
Atlantic.....	2,640	3, " " "	61	10	162	
Franklin.....	2,520	3, " " "	61	10	155	
Oscoda.....	1,900	3, " " "	61	10	117	
Huron.....	1,440	3, " " "	61	10	88.5	
Parrott.....	{ 5,000 in 1888 5,500 in 1889 6,000 in 1890 }	3, " " "	61	10	338	
Boston & Mont.	15,000	3, " " "	60	85	900	
Arizona Comp..	3,000	3, " " "	61	10	184.5	
Copper Queen..	2,800	3, " " "	61	10	172	
Old Dominion..	650	3, " " "	61	10	40	
Moonta.....	1,880	2, " " "	\$5 beyond av- erage quot. of Chili bars.		131.5	Anything realized over 265 by the Syndicate is shared half between the latter and the company.
Montana Mines	26,000	{ 6 months with option to renew. 12 months.	61	10	1,599	Share half profit.
Japan mines....	10,000	{ 3 years till Dec. 31, 1890.	65	85	650	
Boleo.....	5,000		65	85	325	
Total tons per annum.....	175,853				£11,353,000	

Besides which the syndicate is under contract to take all the copper produced in America by the electrolytic process, amounting to about 10,000 tons annually.

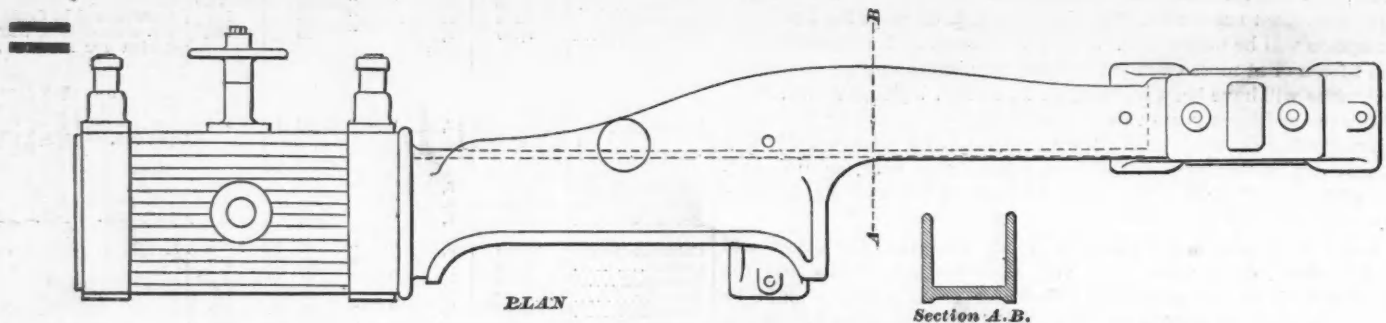
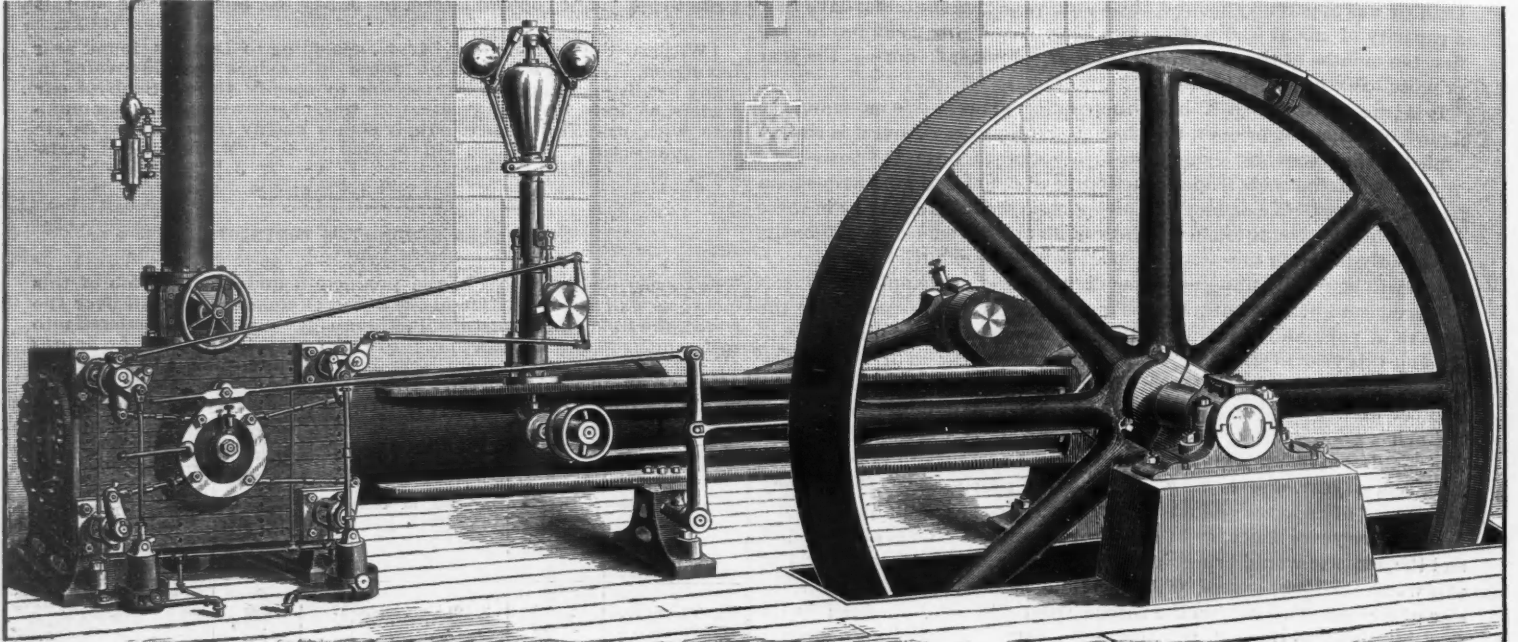
Mr. Doetsch, the leading director of the Rio Tinto Company, succeeded last week in extending the contract with the syndicate for another twelve years, i. e., till December 31st, 1902; and this agreement has been confirmed. The basis of the new arrangement is a higher selling price for the mines, while the Société des Métaux becomes simply the broker between the copper companies and a bank to be established in London, as well as in Paris, and the shares of which will be offered for public subscription in the first half of next month.

THE BULLOCK CORLISS ENGINE.

The M. C. Bullock Manufacturing Company, of Chicago, have lately made new and original designs for the Corliss engines, to be used with their hoisting machinery and for power in general.

As will be seen from the illustrations, there are several features different from all Corliss engines in the market. To begin with, the frame is of a novel and peculiar design, the old-fashioned center web frame being abandoned for one giving more stiffness for the amount of metal used, and allowing more beauty of outline. The pillow block is a massive casting of box section, which peculiarity allows of a large degree of grace in design, and at the same time gives a most rigid distribution of a given amount of metal. The bearing is formed by four cheek pieces, lined with best anti-friction metal, well hammered and bored out. The part containing the bored guides is of tubular form. The top and bottom guides are tied together at each end by a continuation of the guide tube, forming an elliptical opening for access to the cross-head. The reach, or part connecting the guides to the pillow block, is of peculiar section as shown in the cut, with the closed end towards the

shoes, thus avoiding all tendency to bend and break the piston rod. The tendency of the frame to bend or spring, due to the thrust of the cross-head, exists in all engines with girder or Corliss frames. This is usually counteracted by a center foot, which, however, soon loses its efficiency, but this difficulty has been met in the Bullock Corliss by making the center foot adjustable in height, so that every week or month the fastenings may be loosened, allowing the frame to find its true bearing, and then by tightening the fastenings, the foot is rigid again. The connecting rod is new in design, with perfectly adjustable ends. The cross-head end is the familiar wedge block form, but having the novel feature that the work on the brasses is straight and square, with no taper, and shims may be put in to take up wear without having to put them on the wedge faces. The crank is a solid, strong casting, securely fastened to the main shaft, and having a crank pin of extra size of hammered steel. The large pins not only give large wearing surfaces, but also allow the use of high boiler pressure in compounding. The levers actuating the valves are very neat and of oval section. The release mechanism is of the hook form, having square steel blocks. These blocks are so made that each one has eight true edges, allowing of eight



THE BULLOCK-CORLISS ENGINE.

connecting rod. A straight line drawn through the back part of the guide tube to the front part of the pillow block, falls in the flat front side of the reach. Thus it is easily perceived that all up-and-down strains, due to weight and to the thrust of the connecting rods, are taken up in the broad front web of the frame, and all bending strains, due to the fact that the center of the pillow block is not on the engine center line, are resisted by the two broad top and bottom webs of the frame. These two webs start at the pillow block and extend to the side of the guide tubes near to where the cylinder bolts on. The outline of the backs of these flanges is a graceful curve, giving the greatest width and strength where required, and, in fact, the best possible distribution of the metal in the frame, which is cast in such a manner that both guides are sure to be clean and smooth. In all sizes from 18-inch diameter up, the frame is securely bolted to the pillow block, and from 16-inch down is cast with the pillow block. The cylinder is a solid, strong casting of the best close grained iron, bolted securely to the frame. It is designed to give the smallest possible amount of clearance, very large steam and exhaust passages and ports, and with the exhaust passages entirely separated and insulated from the cylinder proper, thus avoiding all cooling of the cylinder by the exhaust steam. These passages are securely braced inside to resist the bursting strains caused by high receiver pressure in compounding and allowing high boiler pressure to be safely carried. The cylinders are insulated with asbestos and covered with a polished hard wood lagging. Each valve is a single piece of cast iron with very large wearing surfaces at each end. At one end is a slot fitting a T head on the valve stem, allowing a free upward and downward movement in direction of wear. The cross-head is a solid, strong, but comparatively light casting with extra large and stiff shoes, which are easily adjusted for wear. The center of the cross-head pin is in the plane of the centers of the

changes of each before new ones are required. The dash pots are also of novel construction, having the large or cushion part at the bottom, and the vacuum part above, thus avoiding the top-heavy appearance of the usual form. All hiss or pound is avoided by allowing means of piping under the floor the entering or escaping air in the cushion. The fly wheels are made with arms of oval section, as presenting the least resistance to the air, and, of course, are made of sizes and weights to suit circumstances. The governor is of new design, and of very sensitive form, running at a medium speed.

In the whole design the idea has been to give the best possible distribution of metal, the use of the best materials throughout, with the largest practical wearing surfaces, and the arrangement of all in a graceful, neat and symmetrical form.

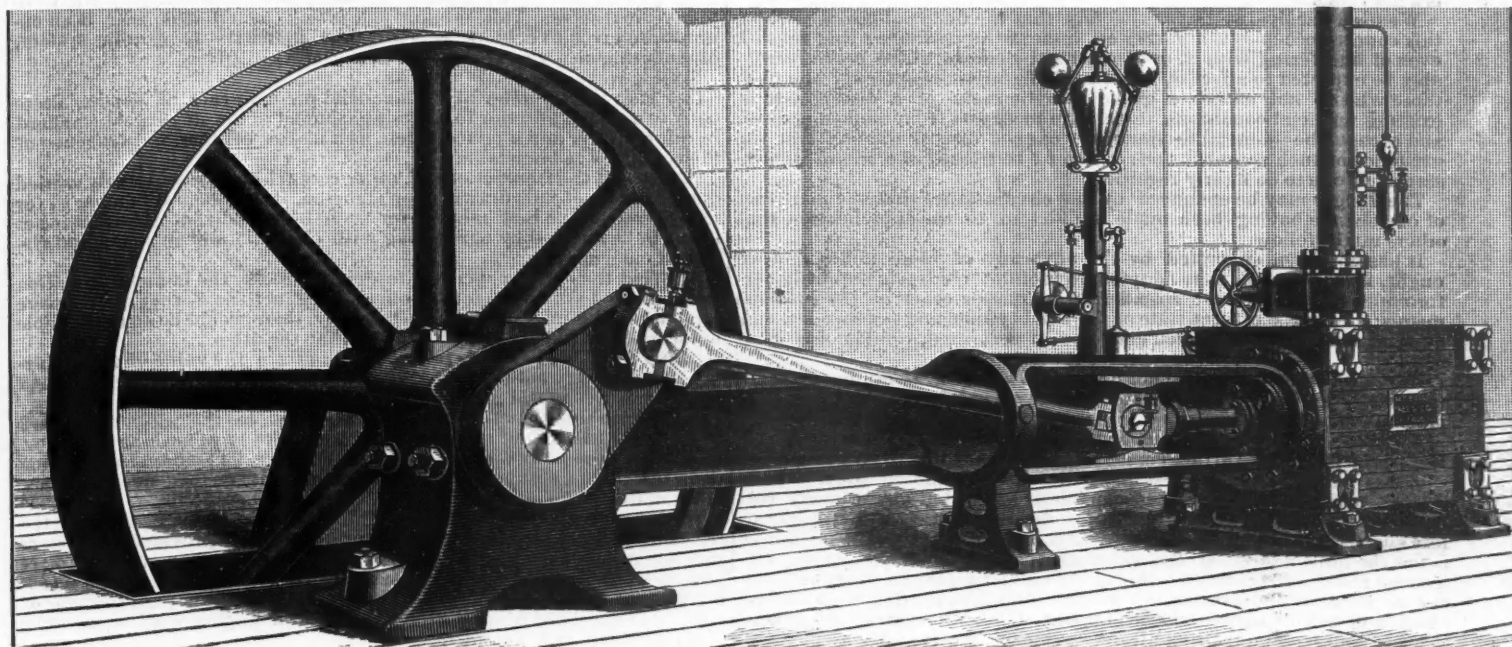
The Imbs Rapid Transit Scheme.—A French engineer who rejoices in the name of Imbs has invented a method of aerial transit, by which he proposes to convey passengers from Paris to Calais in an hour and from Paris to St. Petersburg in eight hours. His principle somewhat resembles that of "telpherage," invented by the late Prof. Fleeming Jenkin. A shuttle-shaped boat of enormous length is to be supported on elevated rails, and drawn by cables passing over rotatory drums, whirling at fabulous speed. The railway (if such a term may be used) need not be horizontal, but each section of it must, of course, be straight. The system, as the inventor remarks, is only applicable to long distances, and will leave the local traffic of the existing railroads undisturbed. One of our technical contemporaries in Paris suggests that the name of the inventor is indicative of the class of people who are likely to assist him with money to carry out his project, viz.—Imbeciles.

SANITARY IMPROVEMENT IN THE QUICKSILVER MINES AT IDRIA.

The following interesting paper by Dr. Hector George appeared in our contemporary *Le Genie Civil*. The two principal deposits of quicksilver in Europe are, as is well known, those of Almaden in Spain and Idria in Austria. The injury to health due to the industry of the extraction of mercury is still frequent at Almaden; at Idria, on the contrary, it has considerably diminished in consequence of the sanitary improvements introduced in these works. The effects of mercurial poisoning show themselves chiefly in three groups of symptoms: Inflammation of the mouth (stomatitis, salivation, and the loss of teeth); shiverings; gradual and general wasting away. It is, above all, in metallic form that the mercury is dangerous, because it is volatile and throws off vapors even at an ordinary temperature. There is a curious proof of this among the accidents which have happened. In 1810, on board an English vessel, "The Triumph," the mercury escaped from barrels in which it was on board. In the space of three weeks 900 men were attacked by distinct mercurial poisoning. The same effects were equally experienced by the animals that were on board ship. The production of quicksilver consists of two series of operations, the extraction from the mine and the distillation. The workmen who extract the ore suffer much less than those who attend to the distillation, because in the mine the mercury exists ordinarily in the sulphide form of cinnabar rather than in the native state, while by distillation the mercury is separated from the foreign substances with which it mixed or combined. For this operation the ore is heated in furnaces, and the sulphurous and mercurial vapors are carried off. The mercury, after having traversed the tubes in which it is gradually cooled, arrives in the condensation chamber, from which it is afterwards collected.

The workmen who collect it, and those who empty the receptacles and

ous, and are rapidly attacked by what they call "calambres" (shivering with convulsion and pain). The number of those suffering in this way, whether from the mines or from the works, is usually about fifty, of which one half die within the year and the other half have to give up their work. Moreover, according to the testimony of Dr. Figueroa, the mercurial vapors spread themselves throughout the entire neighborhood and affect the inhabitants of Almaden themselves. They are pale, bloodless, low spirited and taciturn, and differ entirely from the inhabitants of the neighboring villages. At Idria it was the same formerly; according to Hermann of Vienna, all the inhabitants of Idria experienced the mercurial influence; he added that even the cows which fed in the neighborhood of the furnaces were equally infected; they suffered from salivation. Nowadays the extraction of mercury is much less dangerous than formerly. Dr. Raymond, who has recently visited the mines of this country and the distillation works, and who has compared them with the same undertakings at Almaden, says that one seldom sees a workman at Idria attacked with shiverings, while he has seen a great number, and often severely attacked, at Almaden. The stomatitis (which is the first stage of mercurial poisoning) is sufficiently rare at Idria, whereas it is very common at Almaden. This difference is explained simply by the difference of the sanitary measures taken in the two countries. The superiority of the distillation works at Idria may be summed up in three words: First, perfect organization of the different departments of the works, which are all, as well as the mines, perfectly and carefully ventilated; second, absolute condensation of the mercurial vapors; third, alternation of the work. The workmen are changed every three months, and when one of them is attacked with shivering he leaves the works at once and goes to the mountains, where, under the healthful conditions existing, he is quickly cured. The engineers are to be con-



THE BULLOCK-CORLISS ENGINE.

clean them, are the most exposed to mercurial poisoning, as that is the most unhealthy task. In former days it was reserved for convicts, but as they worked badly and were often suspected of incendiarism, they have not been employed since the commencement of this century. At Almaden the mines themselves are unhealthy. Here also they had recourse to convict labor formerly for working them; according to the testimony of Etmuller the convicts were already ill at the end of a few days work, and according to Fallope they could not continue their work for more than three years. The insalubrity of these mines consists in the fact that the quicksilver is found there not only in the form of sulphide but also in metallic state, the consequence of internal sublimations and slow decomposition of the cinnabar. There results from this mercurial vapors in great abundance, which produce slight amalgams on the surface of copper and gold, as noticed in a recent paper by Dr. Figueroa, and already some years ago reported by Dr. Raymond, who remarked this effect on his watch chain. At Idria, on the contrary, the mines are absolutely healthy. There the mercury is met with only in the shape of cinnabar. The ore is less rich than that of Almaden, and is found mixed with dolomite. This double condition seems to have diminished the harmful action of the mercury, but it necessitates a pulverizing operation which would seem at first sight to be most fatal for the health of the men charged with this work. It has not this effect, however, but this immunity is due to the fact that the ventilation is perfect and far superior to that at Almaden. Nevertheless the workmen at Idria spend more time in the mines than the Spanish workmen; in fact, at Almaden the maximum time allotted for the workmen to remain in the mine is six hours; at Idria they pass eight hours in the mine. But here again, there is a wise sanitary precaution, viz., the subdivision of the hours of work, four hours in the morning, and four hours in the afternoon, separated by four hours of rest. Working in the mines at Idria is so little unhealthy, that the men who are employed in them are never sick, and frequently when a workman employed in the distillation of the mercury is taken with shiverings he asks to be sent into the mine and without any other treatment as a rule, he rapidly recovers. As for the distillation departments in Spain and Austria their difference with regard to health is equally great. At Almaden the sick are numer-

gratulated on the improvements which they have introduced in the working and the administration, and the care with which they have made the sanitary rules respected in the mines and works. Thanks to all these measures, the immediate effects of mercurial intoxication so serious at Almaden are rarely to be noticed at Idria, and the ultimate effects, gradual wasting away by the slow intoxication among the old miners, already very rare nowadays, seem as if they would disappear in the near future.

Manufacture of Chlorine—Weldon-Pechiney Process.—This process has been worked at Salindres in an experimental plant, designed to produce a ton of chlorine daily. This process consists (1) in dissolving magnesium oxide in hydrochloric acid; (2) making magnesium oxychloride; (3) crushing, breaking, and sifting the oxychloride; (4) drying the oxychloride; (5) decomposing the oxychloride by heated air, magnesium oxide being left to again go through the first operation. The solution of magnesium chloride is evaporated so that it contains not more than six equivalents of water, and is then converted into oxychloride by mixture with one and a third equivalents of magnesium oxide. The mass becomes very hard and disengages much heat during solidification, although the operation lasts but about twenty minutes. The pieces are crushed into fragments about the size of a walnut, and these are freed from dust by passing through a rotating sieve. The oxychloride is then dried, and introduced into a special apparatus consisting of a series of furnaces having decomposing chambers, heated by a movable regenerative burner. In the first stage of the decomposition there is a rapid evolution of steam which decomposes a part of the oxychloride, forming hydrochloric acid that passes off with the water vapor. The resulting mixture of anhydrous magnesium chloride and magnesium oxide is decomposed by the oxygen of the air at the high temperature, only magnesium oxide remaining. The products are drawn from the furnace by an aspirator and passed through a hydrochloric acid condensing tower for the retention of the acid at first disengaged—and this is used in the first operation, together with more obtained by the decomposition of salt—while the mixture of air and chlorine passes on and is used for the manufacture of chlorate.—*Jour. Soc. Chem. Ind.*

THE ENGLISH CURRENCY COMMISSIONERS' ARGUMENTS.

(Part II. Signed by Lord Herschell, Hon. C. W. Fremantle, Sir John Lubbock and Messrs. T. H. Farrer, I. W. Birch and Leonard H. Courtney.)

AGAINST THE DOUBLE STANDARD.

We have yet to consider whether the adoption of the bi-metallic system, even if it did effect a cure of all or some of the evils at present experienced, would be itself productive of mischief as great or greater.

We have already pointed out that, so far as the finances of India have suffered from the fall in the gold price of silver, the burden due to this cause would then become permanent.

It is also obvious that if, and in so far as the gold price of commodities has fallen owing directly to the fall in gold price of silver, that fall would, other things remaining the same, be permanent also, and the chance of some rise in these gold prices, due to a rise in the gold price of silver would be lost.

But if, on other grounds, the adoption of bi-metallism were deemed expedient, we should not regard this as a fatal objection, or as counterbalancing the advantages to be obtained from it.

There are other reasons against its adoption deserving of far more serious consideration.

It is alleged that the position of England as the financial centre of the world depends greatly upon the fact that she has, and has for a long time enjoyed, a gold standard.

This is no doubt strenuously controverted, and it is asserted by other authorities that the financial position of England is in no way bound up with the circumstance that she is mono metallic, and that her standard is a gold one.

We need hardly dwell upon the fact that the financial position which this country occupies is a matter of immense importance; that the risk even of interfering with it, or of taking any course which could reasonably be expected to affect it, is not to be lightly encountered; and even those who do not entertain grave apprehensions of a disturbance of existing financial conditions, if we were to depart from mono-metallism and accept the bi-metallic standard, cannot dispute the fact that the existence of such apprehensions is not to be treated as a trivial circumstance, or one to be lightly regarded.

The danger may be enhanced by the circumstance that the mere fact of one change having been made would lead to the apprehension that others might follow.

It has not been suggested by the advocates of bi-metallism that we ought, if that system were adopted, to prohibit contracts requiring performance by the payment specifically of one or other of the precious metals; and in the present state of financial opinion and practice it seems by no means certain that such contracts, if permitted, would not be common.

The result of this might be not only to cause some strain upon the bi-metallic ratio, but to send gold to a premium, and to produce considerable financial disturbance.

A further danger to be apprehended is that the nations who were parties to the bi-metallic arrangement might not continue to adhere to it.

It may be difficult to suggest any motives which should make it their interest to secede; and it may be capable of proof that any country violating the international compact would subject itself and its people to loss and serious inconvenience; but, unhappily, enlightened self-interest is not the only motive of the political action of nations, nor is self-interest always enlightened. A desire to inflict injury may often exercise as potent an influence as self-interest, and the idea that the financial position of one country might be endangered with a resulting advantage to other countries might well afford a sufficient motive for action.

Any such departure from an international compact might indeed set this country free again to act as she chose, but if the result were to compel her to revert to the system she had abandoned, she would undoubtedly find herself in a position worse and fraught with greater evils than if she had maintained her existing standard.

At present the action of this country is unfettered, and not dependent upon the course taken by any other power. This condition of freedom would cease as soon as she became a party to an international agreement.

Dangers arising from this cause would be aggravated if it were found necessary, as we think it would be, to embody in an international agreement detailed stipulations with regard to the coinage, currency, or internal financial arrangements of the several countries joining in it.

Another serious consideration is that the governments as well as the banks and financial institutions of particular countries might, notwithstanding the existence of a bi-metallic system, seek to accumulate gold. It may truly be described as at present the more esteemed metal of the two. There has certainly been a tendency of late years to substitute it for silver as the standard, and to use it to an increased extent for currency purposes throughout the commercial world. With the single exception of the Bland Act in the United States, all recent changes in currency legislation have been in the direction of using gold rather than silver for currency purposes. This fact shows at any rate a sentiment in favor of gold which may not be without its influence; and indeed beyond the mere sentiment, the superior convenience of that metal for monetary purposes may tell in the same direction.

In addition to this, the apprehension that the bi-metallic arrangement could not be relied on as permanent, and the fear of secession from it might operate strongly to induce bankers and financiers to hold as large a stock as possible of gold rather than silver. This might cause a struggle for the possession of gold, with consequent financial disturbance, and with the result that nations who are accustomed to the use of gold for the actual purposes of currency, and who have enjoyed its superior advantages for that purpose, owing to its bulk being less in proportion to its value, might not be able easily to acquire or retain all that its people needed for these purposes.

We have thus pointed out the advantages and disadvantages to be anticipated as the result of entering into the bi-metallic compact suggested.

We have now to weigh the advantages against the disadvantages, and

(Part III. signed by Sir Louis Mallet and Messrs. A. I. Balfour, H. Chaplin, D. Barbour, W. H. Houldsworth, and S. Montagu.)

IN FAVOR OF IT.

It only remains for us to give our reasons for thinking that our colleagues have attached undue importance to the several objections which have been urged against the proposed change. These objections are as follows:

(i.) That "the change proposed is tremendous," and that its "very novelty would excite apprehensions which in themselves might not be without their danger."

To this we reply that the system of currency which we recommend was in existence in other countries for many years before 1873, and its effects practically extended to all the commercial countries of the world. We are not aware that so long as it was maintained in its integrity any evil results ensued. The only novelty in our proposal is that the United Kingdom should join with the other countries specified below in Section 35 in re-establishing a bi-metallic system. We are therefore unable to understand how, in view of the experience of the past, any ground for serious apprehension can exist.

(ii.) That the position of the United Kingdom, and especially of London, as the commercial or financial center of the world would be endangered.

This position, it is urged, is due to the fact that the standard of value in this country is a definite quantity of a particular metal, and that persons entering into transactions, expressed in pounds sterling, consequently know with absolute certainty what it is that they will have to give or receive. This certainty, it is said, would disappear if an option were given to debtors, as is proposed under the bi-metallic system, of tendering either one or two metals.

To this we reply:

(a.) That the commercial and financial pre-eminence of London dates back to a period anterior to the establishment of the single gold standard in this country, and a period when, as a matter of fact, the currency of the country was bi-metallic;

(b.) That if the transactions of other countries are now largely carried out by means of bills drawn upon London, it is because London is, for many reasons, the best market for such bills, and that this fact is not likely to be affected by our joining with other nations in a common system of currency;

(c.) That the option conceded to debtors under the bi-metallic system could rarely have any practical effect, inasmuch as if that system were established and maintained in its integrity, there would be no appreciable inducement to select one metal rather than the other.

(iii.) That if bi-metallism resulted in a fall in the value of gold, England as a country entitled to receive large gold payments would lose, and other countries would gain at her expense.

In reply to this objection we need only refer to the arguments stated in § 96 (k.) of Part I. of the Report, to which we have nothing to add.

(iv.) That the bi-metallic system depends for its successful working upon international support, and that for adequate or inadequate reasons, other nations would, sooner or later, cease to adhere to it.

To this we reply (a) that no sufficient motive can be suggested for the secession of any of the contracting powers; (b) that provided the system was maintained over a sufficiently large area the secession of one or more powers would not be of vital importance; (c) that in any case the seceding power would cause more injury to its own subjects than to those of other countries; and (d) that such an objection applies with equal force to all international agreements.

(v.) That the tendency which is observable among the more civilized nations to use gold rather than silver would be likely, notwithstanding the existence of a bi-metallic system, to encourage the accumulation of that metal, and the creation of an agio upon it, which would thus disturb the ratio fixed by law between the two metals.

To this we reply that the tendency above mentioned is mainly the result of the apprehensions and uncertainty attending upon the existing relations between the two metals; and that all inducement to accumulate gold would cease with a return to a stable ratio of value between them.

(vi.) That there might be a tacit refusal of the people of a country to accept both metals as legal tender, and that contracts would be largely made in one of the two metals only.

The question raised in this objection is rather a matter of opinion than of argument, and we can only say that we do not share the apprehensions of those who foresee any serious difficulty arising from such a course.

Even if it be admitted that it would be largely adopted we do not think that, so long as the legal ratio between the two metals continued in force, any real difficulty could occur.

But we may point out that the objection appears to assume, what has, of course, never been suggested, that the bi-metallic system could be introduced into a country without the consent of those sections of the population who would be most interested in the adoption of such a change. We are satisfied that no such measure as the introduction of the double standard could be passed into law in this country at least, without such an amount of popular support as would practically prevent the possibility of the adoption of such a course as is supposed in the objection we are noticing.

(vii.) That if debts contracted in gold could be paid in silver, the claims of all creditors would unjustly suffer, and that the adoption of a bi-metallic system would thus amount to a breach of faith.

This last objection is that which appears to us to call for the most serious consideration, and we are not disposed to underrate its importance.

If it be right that a government should adopt and impose upon its people a legal standard of value, it is clearly its duty to provide, as far as possible, that such standard shall not be wanting in its most essential attribute, viz., that of the greatest attainable stability.

Recent experience has shown that by the monetary policy of Germany, the Latin Union, and the United States, over which this country had no control, the standard of value in the United Kingdom has been

to answer the question whether in our opinion the result of the change would, upon the whole, prove beneficial.

It is comparatively easy to estimate with substantial accuracy the extent and force of evils or inconveniences of which we have had experience. To weigh with just and accurate balance the possible dangers and evils that might result from a change is a very different matter. They must be largely the subject of conjecture. The opinions of economists and men of experience in financial matters with respect to them have differed, and are likely to differ. Even if not prepared to rate them as high as some have done, we cannot question their reality.

The change proposed is tremendous, and we cannot but feel that to a great extent it would be a leap in the dark.

The public mind certainly is not prepared for it at present, and the very novelty of the proposal would excite apprehensions, which, in themselves, might not be without their danger.

We speak of the novelty of the proposal, because, though it has been for some years publicly advocated with great ability and earnestness, it has not found anything like general acceptance, and those accustomed to the existing system have often been disposed to put it aside as a chimerical proposal, unworthy of serious consideration.

Under all these circumstances, while fully impressed with the difficulties of the present situation, and more especially with those which affect the Government of India, we are not prepared to recommend that this country should proceed to negotiate with other nations a treaty embodying a bi-metallic arrangement. We feel that the matter needs much more discussion and consideration in the financial world, and by practical men, than it has yet received, and that we are not in a position to advise with any confidence that the change could be made safely, or without the risk of creating evils exceeding those which we at present experience.

THE VENSTRÖM MAGNETIC SEPARATOR.

In our issue of October 6th we mentioned the above named separator, which we had seen in operation at the metallurgical works of Mr. E. N. Riotta, 104 Washington street. We were very favorably impressed by the apparent efficiency and simplicity of the machine, and we now for the further information of our readers give an illustration and fuller description.

The Venström separator has been in use for over four years at Danemora and at a number of other mines in Sweden, and has therefore passed the experimental stage. It differs from the other machines on the market in that it is capable of taking ore in large sizes, so that it is possible to eliminate by concentration a good deal of waste rock without the expense of crushing it to a fine size. The machine has a stationary field magnet *A*, Figs. 1 and 2, and an armature barrel *E*, consisting of a number of soft iron bars *E E*, separated from one another by a non-magnetic material—in this case strips of wood. The whole is bound

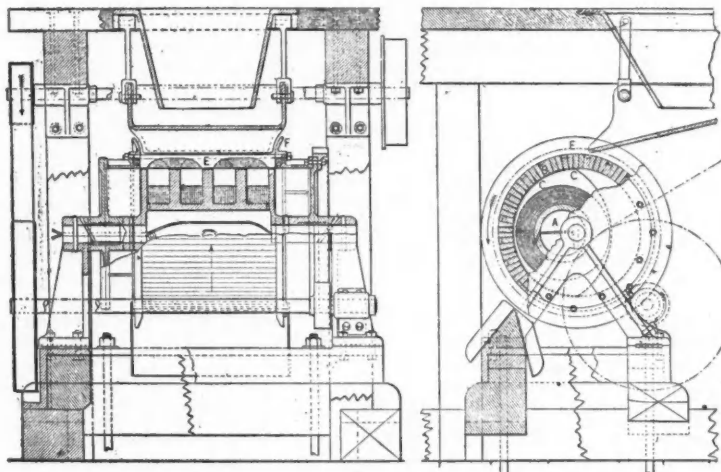


Fig. 1.

Fig. 2.

together by non-magnetic end rings *F*. The bars *E E* are cut away alternately on the inside to make one bar project only toward the north poles of the magnet and the next only to the south poles, as is shown in Fig. 1 at *E* and by dotted lines. This gives each succeeding bar opposite magnetism. On each of the four sections of the magnet are wound 15 pounds of copper wire. An Edison dynamo furnishes a current of 10 amperes and 35 volts. The ore is fed to the barrel by means of a hopper, as shown in the engraving, the cylinder turning in the direction of the arrow in Fig. 2. The magnetic ore adheres to the bars of the barrel and is carried downward past the first delivery chute. Below the machine the bars, departing from the influence of the electro-magnet, which is placed eccentrically, lose their power to hold the particles of magnetic iron ore, and they drop off. The particles of rock in the ore, being non-magnetic, drop off from the barrel almost immediately, and fall on the first chute shown in the engraving. It may be noted in passing that the dropping of ore on the barrel in the manner shown tends to lessen the power needed to make it rotate. It runs at a speed of about 30 revolutions, the power required being relatively small. The Venström machine is made in three sizes, the one used in New York having a diameter of barrel of 20 inches and a width of 15 inches. It is rated at a capacity of 3 tons per hour and will take rock up to 1½ inches in size.

The machine is employed not alone for separating magnetic iron ore, but also for converter cinder, mixed machine-tool filings, droppings from cupolas and spent foundry sand and for shot at blast-furnaces. It has been employed for such uses at a number of places in Sweden.

The largest machine now in use in Sweden will handle any thing that will go through a 3-inch mesh screen, and its output is stated to be 14 tons of clean ore per hour.

gravely impaired, and its future stability, as well as that of the silver standard of India, seriously endangered.

In these circumstances it is evident that if the government, by its direct action in changing the standard, injured the interests of creditors and disturbed existing contracts, it may, by abstaining from action, injure the interests of debtors to an equal or greater extent, and affect future contracts.

It appears to us that if it is wrong in a government to make any change in its standard of value on the ground that it would disturb the relations of debtors and creditors, it must be equally wrong to abstain from any action which it is in its power to take, by which a disturbance in those relations may be averted.

But it is essential to observe that this objection, whatever force attaches to it, is not directed against the policy of bi-metallism as such, but merely against the return to the ratio of 15½ to 1, or some other ratio differing much from the current relative value of gold and silver.

It must also be recollected that it cannot be urged by those who have insisted that the fall in prices is due to causes primarily affecting commodities, and not to the appreciation of gold. If the rupture of the bi-metallic par has not led to the appreciation of gold and to a fall in prices, there appears to be no sufficient reason for supposing that its renewal would affect the value of gold or cause a rise in prices.

For these reasons we do not think that, after giving due weight to the foregoing objection, they are such as ought to be allowed to stand in the way of such a policy as we are prepared to recommend.

Neither metal alone exists in sufficient quantity to serve as a sole standard without causing such a change in the level of prices as to amount to a financial and commercial revolution; but we cannot doubt that if a sufficiently wide area of agreement between the leading commercial countries can be secured, this most important result may be effectually attained, and a great international reform successfully accomplished.

Further, we are strongly impressed with the conviction that whatever evils may be expected to flow from a return to the *status quo ante*, the evils, both present and prospective, of the existing situation are infinitely more serious.

Failing any attempt to re-establish the connecting link between the two metals, it seems probable that the general tendency of the commercial nations of the world will be toward a single gold standard.

Any step in that direction would, of course, aggravate all the evils of the existing situation, and could not fail to have a most injurious effect upon the progress of the world.

A further fall in the value of silver might at any moment give rise to further evils of great and indefinite magnitude in India, while a further rise in the value of gold might produce the most serious consequences at home.

No settlement of the difficulty is, however, in our opinion, possible without international action.

The remedy which we suggest is essentially international in its character, and its details must be settled in concert with the other powers concerned.

It will be sufficient for us to indicate the essential features of the agreement to be arrived at, namely:

(1.) Free coinage of both metals into legal tender money; and

(2.) The fixing of a ratio at which the coins of either metal shall be available for the payment of all debts at the option of the debtor.

The particular ratio to be adopted is not, in our opinion, a necessary preliminary to the opening of negotiations for the establishment of such an agreement, and can, with other matters of detail, be left for further discussion and settlement between the parties interested.

We therefore submit that the chief commercial nations of the world, such as the United States, Germany, and the states forming the Latin Union, should in the first place be consulted as to their readiness to join with the United Kingdom in a conference, at which India and any of the British colonies which may desire to attend should be represented, with a view to arrive, if possible, at a common agreement on the basis above indicated.

We have indicated what appears to us to be the only permanent solution of the difficulties arising from the recent changes in the relative value of the precious metals, and the only solution which will protect this and other countries against the risks of the future. At the same time we approve the recommendations of our colleagues in §§134-137.*

We do not attach much importance to their probable direct effects; but their influence at the present time would be beneficial, while their adoption would place no obstacle in the way of a more satisfactory solution at a future date, and might possibly facilitate it.

The Telephone Two Hundred Years Ago.—How rare it is to discover anything that is entirely new is freshly exemplified to us, says the *Popular Science Monthly*, in what Robert Hooke wrote about what has become of the telephone, as far back as 1664, or two hundred and twenty-four years ago. He said: "And as glasses have highly promoted our seeing, so it is not improbable but that there may be found many mechanical inventions to improve our other senses, of hearing, smelling, tasting, touching. 'Tis not impossible to hear a whisper a furlong's distance, it having been already done; and perhaps the nature of the thing would not make it more impossible, though that furlong should be ten times multiplied. And though some famous authors have affirmed it impossible to hear through the thinnest plates of Muscovy glass, yet I know a way by which it is easy enough to hear one speak through a wall a yard thick. It has not yet been examined how far acoustics may be improved, nor what other ways there may be of quickening our hearing, or conveying sound through other bodies than the air, for that is not the only medium. I can assure the reader that I have, by the help of a distended wire, propagated the sound to a very considerable distance in an instant, or with as seemingly quick a motion as that of light, at least, incomparably swifter than that which at the same time was propagated through the air, and this not only in a straight line, or direct, but in one bended in many angles."

* The recommendations to remove the duty from silver plate, and to negotiate with other countries for the more extended use of silver for currency purposes.

MANGANESE MINES NEAR SANTIAGO DE OUBA.

Before giving you a report on the manganese mines at present being worked and from which 1800 tons of manganese ore have been shipped to the United States, I believe it well, in order to make my report clearer, to give you an outline of the mining laws here and then a description of the manganese deposits discovered in this province. According to Spanish law the person discovering a mine, no matter on what land it is, whether government or private property, submits to the provincial government a plan of the probable extension of the mine. The government then, if all is in conformity with details and fulfilling all the requirements of the law, grants a title to the mine. This title, however, does not take the surface property away from the owner. Later on, when the mines are to be worked, if no terms for the sale of the surface land can be agreed upon between the two parties, the government appraises the land, and at this appraised value the owner of the surface land is obliged to sell to the owner of the mine. This fact has been little understood by Americans coming here to look for manganese mine investments. There is not one manganese mine for sale which lies in the land of the owner of the mines. The work on the mines for sale at present has been very superficial and mostly on a very small scale, and as before working the mines the surface land has to be acquired, for which the owners of the mines as a general thing have not sufficient means, the person desiring to work a mine on a royalty must advance money before taking out any ore. Owing to this fact so few of these rich mines have been worked by American capital. Nearly all the mines are offered for sale at a royalty per ton with conditions of taking out certain quantities of ore. Land of the mines, so far as discovered, is worth on the average from \$3 to \$6 per acre.

The Spanish government, under date of June 30th, 1887, by royal decree, has ordered that manganese mines are exempt from all manner of taxes for twenty years. All material, machinery, tools, etc., to be used in the exploitation of manganese ore are free from import duty. Railroad material, machinery, coal, etc., for mining purposes are all free from import duty. The mining railroad is free from taxes for ninety-nine years. So you see the government here does everything in its power to further the mining industries of this province. One serious drawback which so far has hindered the rapid development of this industry is the want of transporting facilities. The mines at present worked are some distance from the railroad, and in the rainy season it is extremely difficult for them to get their ore down to the railroads in carts and on mules. These mines are divided into ten groups. Seven of these mines can be reached by and are from 1 to 20 kilometers from the Sabanillo & Marote Railroad. The other three groups are near the line of the old Cobre Railroad, destroyed in the first revolution, about 1869.

The Sabanillo & Marote Railroad is a passenger railroad 33 kilometers in length. This railroad carries considerable freight, consisting of sugar, mahogany logs, boards, and other products of the interior. The road-bed is fair and is gradually being laid with new English rails. The rolling stock is very poor and not in the condition to carry ore in large quantities. The terminal facilities in the city are good, but, of course, in the event of large shipments would have to be improved, and a proper dock would have to be built. We have here a dredging machine which could soon dredge sufficient to form dockage for large steamers. Some of the groups of mines are in a direct line with this railroad and could be very easily worked. No doubt arrangements could be made to run ore cars over the road. The three mines on the line of the Cobre Railroad are of large dimensions and offer the advantage of a road-bed which could be restored at comparatively little expense, and also facilities for shipping the ore at Punta Sal, opposite this city. In the plan I submit I have given the names of the different groups and their dimensions.

Group No. 1, Hatillo.—This is composed of one mine, the Cecilia, 100 hectares in size. It is situated 1 kilometer from the Cobre Railroad, above described, and 3 kilometers from Punta Sal, the point where the ore could be shipped. The mine, owing to its close proximity to Santiago de Cuba and the good quality and apparent large quantity of ore, is well thought of. Water is near by.

Group No. 2, called Boniato.—Composed of five mines, in all comprising 130 hectares, is in the immediate vicinity of the Sabanillo & Marote Railroad, and commences at the station of Boniato, 8 kilometers from the city. Work on these mines has been done on a small scale. Owing to their proximity to the railroad the cost of delivery of ore to the cars is very small. The mine of the group furthest away from the railroad can be reached by a level road 3 kilometers long.

Group No. 3, Dos Bocas and Cristo.—Consists of ten mines, in all 338 hectares, and is traversed by the Sabanillo & Marote Railroad, 1 to 5 kilometers further up than Boniato. Deposits of ore can be seen from 200 to 1000 meters from the track. Samples have given about 54 per cent metallic manganese.

Group No. 4, Quemado, etc.—Consists of twenty-three mines, and is distant from Cristo 17 kilometers, from this city on an average 3 kilometers. The high road connecting station with the mines offers no serious topographical obstacles, but, like nearly all Cuban roads, is almost impassable to carts and vehicles during the rainy seasons. Of this group the mines Ysabelita and Boston are the ones from which all but about 100 tons of the manganese so far exported has been taken. To these mines I will refer later.

Group No. 5, Ponusso.—Composed of eight mines, comprising 365 hectares. Its distance is about 15 to 20 kilometers from the station of Cristo, and would, if worked on a large scale, necessitate the building of a railroad. As the country in which this group lies is highly cultivated, being occupied by sugar and coffee estates and forests containing mahogany, a railroad connecting with the Sabanillo & Marote line would, no doubt, be a paying investment, as, apart from the mineral carried, it would have a large carrying trade of the products of this country. The idea is to build a railroad to Guantanamo, which railroad would pass these mines and open up a fertile country, which at present is uncultivated for lack of transporting facilities. The railroad, 75 miles in length, would do an immense passenger and freight business, which is at present monopolized by a line of steamers between here and Guantanamo, and would be benefited besides by the intermediate traffic. The Ponusso mines show excellent mineral, I have been told, and in large quantities.

Group No. 6, Montopolo.—Composed of three mines and, comprising in all 117 hectares, is situated about 11 kilometers from the station of Moron, which station is at a distance of 19 kilometers from Santiago de Cuba by the Sabanillo & Marote Railroad. This group is in a mountainous country, with rivers running through it. Analysis of the ore has given over 50 per cent of metallic manganese.

Group No. 7, Canto Abajo.—Composed of five mines, comprising 315 hectares, is about 14 kilometers from San Luis (33 kilometers from the city), the terminus of the railroad.

Group No. 8, Margarejo.—Composed of three mines, comprising 124 hectares, and is situated 1 kilometer from the terminus of the destroyed Cobre Railroad, at Cobre, 15 kilometers from here.

Group No. 9, Cerca Piedra.—Composed of one mine, comprising 56 hectares, is situated 3 kilometers from the city in a northwesterly direction by the high road.

Group No. 10, Botijo.—Composed of one mine, comprising 60 hectares, is situated 14 kilometers from here is about the same direction as No. 9.

Having to a great extent been compelled to gather the information regarding these mines from parties interested in them, I cannot vouch for entire correctness so far as richness and quantity of ore is concerned. Some of the mines I have visited myself, but, as naturally the investigations so far conducted on mines not worked have been primitive and superficial in the extreme, such work cannot really show the actual worth of these mines, which require study and investigation.

Manganese here is found as a purely water formation in tertiary strata, or at all events with tertiary strata above it, and associated with jasper and crystalline metamorphic rock below. It seems that large deposits are concentrated in certain districts, as proved by the ten groups already described. There has been more manganese discovered, but owing to the large distances from the seaboard, and absolutely no transporting facilities existing, they have not been "denounced," as it is impracticable to work them. What this country needs, and especially this province, is a railroad from here to Guantanamo, and another through the interior of the island, to develop its vast mineral wealth and agricultural resources.

By examining the plan you will find in the Quemado group the mines Ysabelita and Boston. The two are the mines from which the 1,298 tons so far shipped to the United States have been taken. The company working these mines is called the Cuba Manganese Company, New York, incorporated under the laws of the State of New York and recognized by the Spanish Government. The mines so far have only been worked to demonstrate the feasibility of exporting from them large quantities of ore. I have been told by an officer of the company that already \$40,000 have been expended in royalties, wages, freight, etc. For this amount the company has, as stated above, exported 1,298 tons, and has mined 6000 tons more. Having no machinery for washing the ore, although, like almost all the manganese mines, water is in abundance near by, no doubt accounts for the small quantity exported. Then the question of transporting the ore has not been a question of great cost, but also owing to the impassability of the road in the rainy season, almost an impossibility. Transporting the ore in cars to the railroad and in flat cars to the city, and then handling it to put in lighters and load on board the steamers has necessitated putting the ore in bags weighing about 140 pounds each. From the *Boletín Comercial* in its issue of August 1st, I take a fair estimate of the present cost of the ore put in Philadelphia. Price per ton in Spanish gold:

Royalty paid to owners of the mine.....	\$1.10
Cartage, 2 miles, from mine to railroad.....	1.25
Freight, Cristo station to Santiago de Cuba.....	1.27½
Bagging.....	3.25
Lighterage and labor in Santiago de Cuba.....	.30
Freight to Philadelphia and discharging there.....	3.68½
Mining ore, including labor, salaries, and expenses at mines....	4.65

Actual cost of 1 ton of ore.....\$15.81

This at \$1.10 would make \$14.23 in United States currency. This is an enormous expense, and the company, now that the ore has been proved to exist in large quantities, proposes to reduce it to half by either making a rope tram-way from the mines to Cristo station or else building a branch railroad to connect with the Sabanillo & Marote Railroad and avail itself of an existing Spanish law and compel the Sabanillo & Marote Railroad Company to allow the company's ore cars to pass over their track. Then the company proposes to erect a dock of its own where its steamers can load the ore. The mines are worked by open cuttings or drifts on the sides of the hill. The analysis of the ore so far shipped has shown an average of: Metallic manganese, 56.880; phosphorus, .030; sulphur, .003.

Let us hope that this enterprise, which so far has only been a trial, will meet with the success it merits. It has all chances in its favor. There are mines enough in the vicinity of the Ysabelita and Boston mines to warrant the outlay of capital to work the mines in a proper and economical manner, and this capital once employed will yield good results. The Spanish Government, not alone through its laws, but by taking an interest in the enterprise, favors and protects the company.—*Consular Report of Otto E. Reimer.*

Smallest Steam Engine in the World.—It is stated that the smallest steam engine ever made has just been completed, after two years of labor, for the Paris exhibition. It is composed of 180 pieces of metal, is a shade under three-fifths of an inch in height, and weighs less than one-ninth of an ounce. A watchmaker made it.

Tobin Bronze.—Passed Assistant Engineer John A. Tobin, U. S. N., of East Providence, has brought out a new bronze known by his name, which the Ansonia Brass and Copper Company is putting on the market. It is sold in the form of sheets and plates, rods, wire, seamless tubes and ingots. The latter are of three qualities, which are suitable for a large variety of purposes. A test made by Professor Thurston shows a tensile strength of 67,600 pounds per square inch of original section. A series of tests made of hot rolled Tobin bronze by a board of naval officers gave a tensile strength varying between 58,784 and 59,905 pounds, and 5 to 5.625 per cent elongation, crosswise, and between 54,704 pounds and 62,389 pounds tensile strength and 4.5 and 7.375 per cent elongation in the direction of its length.

Mica and Asbestos Deposits in New York City.—The aqueduct engineers discovered these minerals when they were crossing the Harlem River and coming down Tenth avenue. This discovery immediately aroused the interest of a few mining experts and geological students, and now every Sunday groups of men with little mallets in their hands may be seen among the rocks which bound the gorge through which the narrow stream of the upper Harlem River runs, breaking off here and there specimens of more or less value and secreting them in their specimen bags. A mine of asbestos was discovered beneath the Harlem River on the line with the aqueduct. The workmen exploded a blast, and the shaft was at once filled with fragments of the pure white mineral fiber. At its bottom there was found the opening of a large pocket, which, if worked, would have been no doubt valuable. Shortly after this, while the aqueduct laborers were blasting in Tenth avenue, they found a mica deposit which had apparently a great extent. The mica was peculiarly pure, the strips showing not a flaw. The color was white. But all this mineral wealth had to go for nothing, for it was necessary for the aqueduct to be pushed to completion despite every obstruction, and so the advantages of asbestos and mica mines within the city limits were lost.

Penetration of Daylight in the Water of Lake Geneva and of the Mediterranean.—MM. Fol and Sarasin give a summary of the results obtained by them in regard to the penetration of daylight in clear water. They employed sensitive photographic plates, so arranged with a new apparatus that they could be exposed for the time selected, say ten minutes, at any desired depth, as 100, 200, or 300 meters, etc. In the first trials made it was found that the effect was stronger on September 28th, with a cloudy sky, than on August 16th, with fine weather; more particularly they found that in the former month the amount of light at a depth of 170 meters was comparable to that of a clear night without moon. The extreme limit for the penetration of daylight during the winter was something more than 200 meters. The difference between this limit for March and September was only some 20 or 30 meters, proving that the effect of the seasons, so great in the upper layers of the lake, as shown by M. Forel, is comparatively small at considerable depths. In the Mediterranean the depth is greater. In the month of March it was found here that 400 meters was the limit of transmission of daylight. Further, subsequent experiment showed that at 300 meters the light reaches during the whole time that the sun is above the horizon, and at 350 meters this is true for some eight hours of the day.—*Am. J. of Science.*

The Brazilian Barrancas.—Some of the upland regions of Brazil, especially near the city of Barbecena, says the *Popular Science Monthly*, are marked by the appearance of great rugged hollows in the sides and slopes of many of the rolling, grass-covered hills. They are land-slips caused by the existence of springs, and present an appearance picturesque in the extreme. Their sides are worn into every imaginable shape of pinnacles, domes, pointed towers, buttresses and cavities, with ravines, narrow, deep and precipitous, or wide, open spaces, surrounded by lofty, perpendicular walls, riven by creeks, and ready to fall. But their great charm lies in their color. The prevailing tint is a deep Indian red, which, combined with the green hills and the blue sky, bearing its glistening white clouds, constitutes a charming combination of tones. Any one of these barrancas, as they are called, offers excellent opportunities to the geologist. In many of them are found lying upon beds of sandstone, near the floor of the hollow, extensive deposits of fine laminated clays, varying in thickness, but frequently divided into layers like sheets of paper, with varieties of colors, pink, blue, white, black, gray, orange, crimson, purple and yellow, lying side by side. Professor Agassiz described precisely similar formations in the valleys of the Amazon. Many of these barrancas show an upper stratum of white or yellow quartz, conglomerate, exceedingly rich in gold; and gold can often be got out of the surrounding earth from the top to the bottom of the sides, the hills being, as it were, literally "peppered" with the precious metal.

Compressed Air for Blast in Cupola Furnaces.—An important experiment for applying compressed air direct to a cupola furnace for the melting of iron for casting purposes was successfully carried out, according to *Ryland's Iron Trade Circular*, a few days ago by the Birmingham Compressed Air Power Company. The experiment, which induced the attendance in Birmingham of nearly forty members of the South Staffordshire Institute of Civil Engineers, took place at the iron foundry of Messrs. J. Cartwright & Sons, in New Bond street, and was superintended by Mr. Locock, resident engineer of the company. Hitherto the air has been applied to the cupola through an American patent blower. The air is now applied direct from the pipe through a jet resembling a steam jet. The volume of compressed air used carried with it nearly 150 times its own volume of free atmosphere. The admission and pressure of the air is easily and promptly regulated by the turning of a wheel which opens or closes the aperture through which the compressed air is admitted. Messrs. Cartwright, the makers of this fair injector, state that in the melting of five tons of iron they saved one and a half hours in time, and they estimate that an economy of 40 to 50 per cent will be effected in the cost of the process of melting. By the application of the air direct to the furnaces, the engine, and, consequently, the engineer, are dispensed with, and the apparatus can be regulated by the man in charge of the cupola, the danger of accident from the use of steam boiler or of the machinery being avoided.

Queensland Mining Statistics.—In 1886 the total yield of the Queensland gold-fields was 340,998 ounces. In 1887 the yield was 425,923 ounces, or an increase of 84,925 ounces. In the northern division in 1887 the Charters Towers and Cape field produced 144,379 ounces, out of a total of 195,185 ounces, and in 1887, 151,377 ounces, out of 225,234 ounces. The most promising field, however, was perhaps the Croydon, where a production of 2144 ounces in 1886 increased to 31,788 ounces in 1887. The central division increased from 57,031 ounces in 1886 to 93,969 ounces in 1887, this improvement being entirely due to the Rockhampton gold field (Mount Morgan), of which the output advanced from 49,086 ounces in 1886 to 85,905 ounces in 1887. Of the total gold raised in 1887, 404,223 ounces were obtained by quartz crushing and 21,700 from alluvial workings. There was a gross total of 9805 miners employed, of

whom 855 were Chinese, who were mainly employed in alluvial mining. The average yield in 1887 per ton of quartz crushed was 1 ounce 1 penny-weight 12 grains. In 1886 there was a total quantity of tin raised of 3153 tons, value £162,124, against 3279 tons, worth £217,389 in 1887, when, however, the market price was higher. Of silver and lead, 1631 tons were raised in 1886, worth £52,797, against 2183 tons, value £80,092 in 1887. There were 110 tons of antimony raised in 1886, but none in 1887; while of copper 900 tons, worth £7000, were produced in 1886, against 1010 tons, worth £7600, in 1887. Finally we come to coal, of which 228,656 tons were raised in 1886, value £95,243, and 238,813 tons in 1887, value £97,460. There were 2629 miners at work in 1887 on minerals other than gold.

Russian Meteorite at Nowo-Urei.—This meteorite, which fell September 22d, 1886, near the village Nowo-Urei, Government of Pensa, Russia, is unique in containing carbon in the form of diamond. Three stones were known to fall, of which two were found. The external appearance did not differ from ordinary meteoric stones, and on the fracture they appeared of a dark gray color, and showed the presence of the chief constituents, olivine, augite and nickeliferous iron. In the course of the analysis, from 2 to 2.5 per cent of the material taken remained unattacked by acids, and of this, 60 per cent was amorphous carbon and 40 per cent resisted fusion in bisulphate of potash. The residue was in the form of light gray grains; it proved to consist of 89.6 carbon and 10.4 per cent ash, and had a specific gravity of 3.1; the hardness was sufficient to scratch corundum readily. It was consequently concluded that the substance must be ordinary diamond or the massive form carbonado. An analysis of the whole stone gave:

Fe (Ni)	Cr ₂ O ₃	Fe ₂ S ₃	C	Silicates
5.47	0.95	0.43	2.26	90.76-99.87

The diamond-like carbon made up about 1 per cent of the whole. The silicates consisted essentially of olivine and augite in the ratio of 67.5 to 23.8. In amount of carbon this stone is exceeded only by that of Orgueil, which gave 4.1 per cent in form of a humus substance. As regards the occurrence of the carbon in the diamond form, the only related cases are those of the Arva iron, in which Haidinger found cubic crystals of a graphitic substance with apparently pyritohedral planes, and which Rose suggested might be pseudomorphs of graphite after diamond; and the related graphitic mineral cliftonite, from the meteoric iron of Youngdegin, W. Australia, recently described by Fletcher.

A New Insulator.—It is stated that Mr. Donald Nicoll, Assoc. Inst. C. E., of London, was the first to discover and make use of plastic bitumen as an insulator, and that recently he has discovered a new application and method of treating the compound of which bitumen still forms one of the chief ingredients, and to the new application he has given the name of "The Nicollian Fabric." This fabric is pliant as well as waterproof, and can easily be applied to almost any textile substance, as well as for insulating purposes. The inventor claims that it is better than india-rubber or gutta-percha, being less perishable, while the cost will be only about one-thirtieth of either of those products. There is one great advantage in the manufacture of the compound, viz., that no expensive machinery or skilled labor will be required. Amongst the many uses to which the new compound can be applied, it may be mentioned that life-buoys and floating ropes have already been designed. It is also said that if applied between planks or metal it will prevent leakage as well as be conducive in lessening the danger in the event of collisions between vessels at sea. Moreover, the inventor believes that it could be made of sufficient thickness as to resist the impact of almost any known projectile. The ropes made are so extremely buoyant that they will form a valuable adjunct to the nets of fishermen engaged in the deep sea fisheries, who, by their use, will be enabled to float their nets and so do away with the use of the present clumsy cork and bladder floats. A sample of the rope has been submitted (at the instance of the Royal Humane Society) for use on the Thames embankment, and the fabric can also be manufactured into flexible tubes for conveying water in mining and other similar operations. As an insulator of telegraph, telephone and electric lighting conductors, it should be largely used on account of its pliability, cheapness and durability. The materials from which the fabric is made are, it is stated, abundant and practically inexhaustible.

BOOKS RECEIVED.

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

Twenty Years with the Indicator. A Practical Text-Book for the Engineer or Student. By Thomas Pray, Jr., C. and M.E. Published by John Wiley & Sons, New York. Pages, 283. Price, \$2.50.

Practical Designing of Retaining Walls. By Professor William Cain, A.M.C.E. Published by D. Van Nostrand, New York. Pages, 169; price, 50c.

Outline of Plans, with illustrations, for furnishing an abundant supply of water to the city of New York, independent of the Croton water-shed. By John R. Bartlett and Associates. New York, 2 Wall street. Pages, 99.

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

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

PATENTS GRANTED NOVEMBER 20TH, 1888.

- 392,978. Dry Separator and Amalgamator. Martin L. Allstot, Lawrence, Kans.
 393,005. Furnace. James Gilbert, Omaha, Neb.
 393,009. Dumping-Car. Walter Heathcock, West Point, Miss.
 393,029. Insulating Composition. Adolph Poitevant, Gainesville, Miss.
 393,064. Steam-Boiler. Nicholas Furlong, Brooklyn, N. Y.
 393,073. Transformation and Distribution of Electrical Energy. William J. McElroy, Pittsburg, Pa., and Thos. J. McTigue, New York, N. Y.
 393,091. Reverberatory Furnace. Michael M. Bair, Paris, France.
 393,065. Centrifugal Amalgamator. James B. Brewster, New York, N. Y.
 393,127. Petroleum-Engine. Adolf Spiel, Berlin, Germany.
 393,172. Air-Compressor and Regulator therefor. Auguste Nosbaume, Antwerp, Belgium.
 393,306. System of Developing and Working Mines. Nelson P. Hulst, Milwaukee, Wis.

PERSONAL.

Mr. W. A. Clark, of Butte, Mont., is at present in New York.

Mr. A. O. Ihlseng, Mining Engineer, of Silverton, Colorado, will shortly return to New York for the winter.

Mr. Walter McDermott, Consulting Mining Engineer, is at present in Idaho Territory on professional business.

Mr. Wm. E. Dickenson has been appointed Superintendent of the Colby iron mine of the Gogebic Range, Michigan.

A committee has been appointed to look into the feasibility of establishing a college of mining at the State University of California.

Professor Huxley has returned to England from a long stay abroad, but, though better for the change, he is still unable to do much work.

Mr. E. E. Robinson, of Pennsylvania, has been appointed Superintendent of the Hudson Steel and Manufacturing Company, of Birmingham, Ala.

The many friends of Dr. T. Sterry Hunt will be glad to learn that he has now made his home in New York City, and may be found at the Park Avenue Hotel.

Mr. W. F. Robertson, of Montreal, has been appointed superintendent of the smelting works of the Tamarack-Oscocia Copper Manufacturing Company, at Dollar Bay, Mich.

The joint convention of the National Federation of Miners and Mine Laborers and National District Assembly No. 135, Knights of Labor, will be held at Columbus, Ohio, December 5th.

Mr. W. H. Bunce, the financial agent of the Morning Star and Ward Consolidated mining companies, of Colorado, has resigned in order to accept the superintendency of the Central Public Sampling Works at Pueblo, Colorado.

Mr. Edgar P. Rathbone has retired from the firm of Messrs. Bainbridge, Seymour & Rathbone, Mining and Consulting Engineers, of London, England, and business will be carried on as before under the style of Bainbridge, Seymour & Co.

The *Electro-Mechanic*, a paper devoted to electrical and mechanical engineering, is published monthly by the Electro-Mechanic Publishing Company at Kansas City, Mo. It is said to be the only paper of its class published west of the Mississippi River.

The Association of Boiler Inspectors of the United States and Canada was organized this week at Pittsburg, Pa., with the following officers: President, Wm. McClellan, of St. Louis; Secretary, Wm. Guthrie, of Chicago; Treasurer, Washington Mullin, of New York.

A number of gentlemen from Denver, Colo., interested in mining, are at present in New York. Among them is Mr. David Moffatt, President of the First National Bank of Denver; Mr. R. T. Morrison, the well known mining lawyer; Mr. John Arkins, editor of the *Rocky Mountain News*, and Mr. Samuel Adams, formerly of the Adams Mining Company.

Mr. W. B. Phillips, late Professor of Mining and Metallurgy at the University of North Carolina, and Mr. Clarence R. Claghorn, late engineer State Line & Sullivan County Railroad (Loyalsock coal mines), of Bernice, Pennsylvania, have opened an office at Birmingham, Ala., under the firm of Phillips & Claghorn. They will furnish reports on all kinds of mining property, technical and metallurgical processes, analyses, and assays.

Mr. Benjamin S. Church, Chief Engineer of the New York Aqueduct, has resigned his position, and Mr. Alphonse Fteley, the present consulting engineer on the aqueduct, has been appointed engineer-in-chief in place of Mr. Church. The new arrangement will go into effect immediately. Mr. Church will continue to act as consulting engineer. Mr. J. Imbrie Miller, Principal Assistant Engineer on the Croton Aqueduct has also resigned.

One of the principal members of the faculty of Columbia College, New York, states that Professor Barnard would probably remain in control until June, and that then Professor Dinsler will probably assume direction for a year or so. At the end of that time the new permanent president, who is to carry out needed reforms, modernize the system of teaching and elevate the college into a university, will be chosen. The two men most prominently mentioned for the position are George L. Rives and Seth Low.

The nine scientific experts required by the joint resolution of Congress to act as assistants to the Commissioner-General at the International Exposition to be held at Paris next year, and who are to be assigned to the nine groups into which the exposition is divided, have been appointed by President Cleveland. They are as follows: R. C. Hawkins, of New York; Prof. Arthur J. Stace, Notre Dame University, Indiana; Prof. Spencer B. Newberry, Cornell University, Ithaca, N. Y.; Prof. C. V. Riley, Department of Agriculture, Washington, D. C.; Prof. W. H. Chandler, Lehigh University, Pennsylvania; David Urquhart, Jr., Louisiana; Prof. Chas. B. Richards, Yale College, Connecticut; Prof. Howard A. Clark, National Museum, Washington, D. C., and David King, Rhode Island. These gentlemen will be hereafter each assigned to one of the nine groups, viz., art,

education, furniture, textile fabrics, extractive arts, mechanical industries—electricity, food products, agriculture and horticulture, into which by official classification the exposition is divided. They have not yet received their instructions. Their duties will begin with the opening of the exposition, May 5, and will conclude when they have made report of their proceedings in writing to the Commissioner-General. Their allowance for salary and personal expenses is not to exceed \$1,500.

INDUSTRIAL NOTES.

The Bluffton Iron Ore Company, at Bluffton, Ga., contemplate building a 100-ton coke iron furnace.

Fourteen furnaces in the Shenango Valley, Ohio, have advanced the wages of their employes from 10 to 15 cents a day.

The Clymer Iron Company's large furnace at Temple, Pa., which has been out of blast some months, has resumed operations.

The Bethlehem Iron Company, of Bethlehem, Pa., will hold a meeting on the 28th inst., to consider an increase of the capital stock.

The North German Bank, the Disconto Gesellschaft and the Krupps have formed a company for the purpose of building railways in Venezuela.

The Beaver Falls Rolling Mill, at Beaver Falls, Pa., was destroyed by fire on the 19th inst. Six men were burned, two perhaps fatally. The fire was caused by experimenting with Lima oil in generating gas.

The Calera Furnace Company, at Calera, Ala., has decided to reorganize and to go into full operation at an early day. Dr. Pierce, the general manager, has gone to Murphy, Ga., to organize a new plant at that place.

The extensive works of the Fort Wayne Jenney Electric Light Company at Fort Wayne, Ind., were destroyed by fire on the 23d inst. The costly arc machinery, the engines, the incandescent department, and the Star Iron Tower Company are a total loss, the value of which is estimated at \$300,000.

Marquette (Mich.) proposes to utilize the water power of the Dead River within two or three miles of the city by purchasing it, and from it to furnish all the electric lighting needed for municipal and private use; also, 300 horse-power for the use of the city, and 1000 horse-power for private consumers.

The Bessemer Iron and Steel Company on the 16th inst. filed in the office of the Probate Judge of Jefferson County, Ala., a mortgage in the sum of \$500,000, securing first mortgage bonds. The purpose of the loan is to invest that amount in improvements in and about the company's present plant, and to increase the present facilities for making iron.

The subscribers to the \$100,000 prize offered for a plan by which the water-power of Niagara Falls can be utilized have formed a joint stock company with a capital of \$125,000, under the name of the Niagara River Improvement Company, of Buffalo, limited. The prize is to be given to the successful competitor in consideration of his transferring his entire interest to the company.

A big project is on foot among the capitalists of Cleveland, Ohio, to supply the cities and towns of Ohio with water from Lake Erie. It is designed to run the water-pipe line direct to Columbus, and thence to Cincinnati, giving force to the supply by pumping engines. Reservoirs are to be constructed for securing an uninterrupted flow in case of accident. The main line will be tapped to supply smaller cities.

The Detroit Railroad and Tunnel Company has been incorporated at Detroit, Mich., for 999 years, with a capital stock of \$1,500,000, more than half the estimated cost of the tunnel under the Detroit River. The stockholders are: Luther Beecher, Mary Beecher, Luther Trowbridge, George A. Beecher, Frederick A. Baker and James A. Halleck. It is stated that work will begin early in the spring.

Messrs. Oliver Bros. & Phillips are changing their furnaces at the South Tenth street mill, Pittsburg, Pa., to make them like the puddling furnaces in their Allegheny plant. They are not altering the furnaces in a body but one by one as they are shut down for some repair. The firm is also building a new heating furnace at their Thirteenth street steel works. This will enable the men to run more heats than they have been able to do lately because of the scarcity of gas.

The Grand River Coal and Coke Company, of Glenwood Springs, Colo., are fully occupied, and have such a demand for coke that they are building another 100 ovens at Cardiff as rapidly as possible. The quality of the coke is said to be the best ever used in the West, and the following are two analyses made by the Holden Smelting Company:

	(A)	(B)
Hygroscopic water at 100° C.....	00.53	00.25
Volatile matter.....	50.70	00.91
Fixed carbon.....	88.44	88.58
Ash.....	10.27	10.26

(Ash contains 5.05 per cent silica.)

Chief Constructor Wilson has submitted to Secretary Whitney his annual report of the operations of his bureau during the last fiscal year. The present strength of the Navy and conditions of the vessels is stated as follows: "Five double-turreted monitors awaiting completion; two helted cruisers, preparing ways;

thirteen single-turreted monitors, in ordinary; twenty-three unarmored steel and iron vessels, four of which are in commission, eleven building, two repairing, five on station and one in ordinary; twenty-eight wooden steam vessels, nearly all on station or undergoing repairs, and eleven iron and wood steam tugboats.

Some months since Mr. Abram Reese, of Pittsburg, Pa., procured a patent on a process of rerolling steel rails from standard sizes to those of small gauge. A company has been organized in Chicago, Ill., for the purpose of erecting a plant to utilize the invention. The company is composed of Abram Reese, Harry Reese, William Haslage and Thomas W. Davis, of Pittsburg, and five capitalists of Chicago. The capital stock is \$200,000, all of which is paid up. The site selected for the new plant is at Hartford City, Blackford County, Ind., located 167 miles east of Chicago. As an inducement to locate the new plant in that place the authorities offered 100 acres of ground in fee simple, which includes a natural gas well with a capacity of 350 pounds pressure. Work will be commenced at once on the main building. The object of the company is to roll old rails into smaller rails and also to manufacture splice bars and bolts for small rails, as well as spikes of proper sizes for small rails.

The recent purchasers of the Catoctin Iron Furnaces, Md., have organized a new company, to be known as the Catoctin Mountain Iron Company, Frederick County. The incorporators are Messrs. Thomas Gorsuch, Geo. Houck, Steiner Schley, L. R. Waeche, G. J. Doll, L. E. Hedges, Geo. E. Shipley, Edward Baker, Thomas M. Markell, C. V. S. Levy, Ira Tyler and D. O. Bradley, of New York. The capital stock is \$90,000. Mr. Thomas Gorsuch has been elected President of the company, L. R. Waeche Secretary and Manager, and George Houck Treasurer. The present daily output of the furnace is between 30 and 40 tons, and large quantities of it are purchased by the United States Government. The company has just succeeded in effecting a lease of its ochre clay beds to a party of capitalists from New York and Philadelphia, who will at once establish a plant for the manufacture of ochre. The mill will have a daily capacity of about 200 barrels.

CONTRACTING NOTES.

Our list of machinery and supplies wanted will be found on page xii. Manufacturers of machinery, engineers and contractors should consult our directory of "Contracts Open" on the same page. This week, proposals are invited for the following new contracts: No. 1182, Steel Wire; No. 1183, Cast-Iron Mortar Bodies; No. 1184, Steel Gun Forgings; No. 1185, Steel Gun Forgings; No. 1186, Rock Excavation and Dredging; No. 1187, Railway Construction; No. 1188, Mortars for U. S. Ordnance; No. 1189, Railway Construction; No. 1190, Extension of Breakwater.

Contractors wishing to undertake the construction of railroads in Chili (in fifty-mile sections) are invited to call upon the North and South American Construction Company, No. 1 Broadway, New York City.

It is stated that the War Department will invite proposals next week for supplying the pneumatic dynamite guns invented by Capt. Zalinski, some of which will be placed in New York Harbor. The current army appropriation bill authorizes the expenditure of \$400,000 for these weapons.

GENERAL MINING NEWS.

Shipments of iron ore from the mines of the districts mentioned below for the season up to and including November 14th, as reported by the *Marquette Mining Journal*, were as follows:

	Tons.	Tons.
Marquette, Marquette District.....	1888.	1887.
St. Ignace, ".....	811,426	795,794
Escanaba, ".....	107,287	90,188
".....	799,318	850,829
" Menominee District.....	1,067,508	1,116,832
Gogebic District.....	199,462
Ashland, ".....	1,002,931	1,040,727
Two Harbors, Vermillion District.....	422,982	388,799
Total tons.....	4,410,914	4,283,169

VIRGINIA & ALABAMA COAL COMPANY.—This company has just been organized with T. C. Leake, Jr., of Richmond, Va., as President; J. R. Ryan, Birmingham, Vice-President; W. E. Leake, Patton, Secretary and Treasurer. It has purchased and will develop the properties of the Virginia & Alabama Mining and Manufacturing Company. A meeting will be held December 1st to consider the issuing of \$250,000 of bonds.

ALABAMA. FORT PAYNE COAL AND IRON COMPANY.—This company has been organized, with a capital of \$5,000,000. The directors are Governor-elect Goodell, of New Hampshire; the Hon. Henry Pierce, of Boston; the Hon. Selden Connor, ex-Governor of Maine; the Hon. Jas. W. Spaulding, of Maine; the Hon. F. G. Jilkson, of Providence; Horatio Adams, of Boston; W. J. Cameron, President of the First National Bank, Birmingham; John B. Brodie, Vice-President of the Board of Trade, Birmingham; W. H. Rice, Kansas City, Mo.

The company has purchased 22,000 acres of coal, iron, and town site lands at Fort Payne. One million of the capital stock will be held in the treasury. In addition to the coal and iron industries, the fire-brick, lime, silica, and granite properties in which the tract abounds will ultimately be developed.

CLUBURNE COUNTY. MOSS BACK GOLD MINING COMPANY.—This com-

pany, which has a capital stock of \$300,000, has been organized, with James M. Sullivan as President; P. S. Jones, Secretary and Treasurer, and J. W. Houston, Superintendent. It will erect a mill and other machinery at its mines in this county.

TALLADEGA COUNTY.

MAY-VIRGINIA MINING COMPANY.—This company, of Talladega, has suspended operations altogether for the present. The machinery is still being placed to begin milling by the first of the coming year.

ALASKA.

From the annual report of the Governor of Alaska, Mr. A. P. Swineford, to the Secretary of the Interior, we learn that the white population has greatly increased. In regard to the settlement of the public lands, he states that all settlers in Alaska upon the public lands are mere squatters who are awaiting legislation from Congress which will enable them to secure titles. The only obstacle in the way of agriculture, in the opinion of the Governor, is that the lands are not available for settlement. He says that the climate is favorable and the soil rich. Other gold mines are being developed in Douglas Island and the report notes the sale of four claims for \$1,500,000. Promising silver discoveries have been made. The Governor thinks that there is enough coal in the territory to supply the whole of the United States for centuries.

ARIZONA.

PINAL COUNTY.

J. C. REYMERT.—A correspondent informs us that the ore of this mine is not only manganiferous but calcareous. The silver is probably 80 to 90 per cent of it in a sulphide state, but owing to the caustic lime formed during roasting only 60 to 70 per cent of it is chloridized; a further chloridizing in the pans is impossible owing to the caustic solution neutralizing all bluestone added. Additions of sulphuric acids up to 9 pounds to the pan fail to improve matters. The Russell process, it is thought, will be the last resort, as the caustic lime can be removed with the wash water before using the solution. Tests by the latter process have not yet been made; what tests have been made were to save a higher percentage by the present process.

SILVER KING MINING COMPANY.—A correspondent informs us that the company was recently running only twenty stamps of the wet crushing mill, and a great many men have been discharged. The miners say that it is doubtful if the other twenty stamps will ever be run again, and it is thought that the mine has seen its best days.

CALIFORNIA.

The coal mines of the Pacific coast have been but poorly developed as yet. The Slack's Cañon mines, San Luis Obispo County, are likely to be abandoned soon, as the prospects do not warrant the building of a road to the mines. The total yield from the California mines is only 12,000 tons of coal a year. Coal seams are known to exist in the mountains of Humboldt and Mendocino counties, but until the railroads open up that region the coal will not be mined.

AMADOR COUNTY.

NORTH STAR.—We are advised that there is great excitement over the strike on the 600-foot level of this mine. Ore has been found that will mill, it is said, \$100 per ton. This mine is situated north of the Sutter Creek on the "Mother Lode."

WILDMAN.—This mine is adding ten more stamps to its mill.

LOS ANGELES COUNTY.

In the San Francisco cañon, about 18 miles from the Southern Pacific R. R. track, a ledge of graphite has been found by Messrs. Liddell, Hoy & Lane. The ledge contains, it is said, 82½ per cent. of pure graphite, the rest being grit.

NEVADA COUNTY.

BRUNSWICK MINING COMPANY.—Mr. Henry B. Murray, the president of the company, operating in the Grass Valley District, has been in Grass Valley to arrange for the resumption of development work. Only a little over \$2000 is owed by the company to business men and miners of Grass Valley, and the indebtedness will be paid by Mr. Murray. It is the intention to sink the shaft 200 or 300 feet.

COLORADO.

CLEAR CREEK COUNTY.

The Consolidated Republican Mountain Mining Company and the Lebanon Mining Company have placed the deeds and settlement papers on record at Georgetown, final steps necessary to carry out the satisfactory terms arranged last Spring. For over ten years these companies have been engaged in litigation hindering the development of their vast resources, but from now on matters will move rapidly. There are some 20,000 tons of concentrating ore on the dump at the Everett Tunnel awaiting the erection of concentration works for which the plans are already made. It is also in future contemplation to further utilize the water-power appurtenant to this property for operating machinery in the mines.

CUSTER COUNTY.

GEYSER MINING AND MILLING COMPANY.—We are informed that the company's attorney, Mr. Scott, and one of the directors have been sent to Colorado with necessary funds and orders to start work at once. In our issue of October 20th we referred to the organization of this company—this Phenix, which has risen from the ashes of the ill-fated Security Mining and Milling Company.

PHENIX LEAD COMPANY.—It is stated that this company contemplates sinking a 100-foot winze on the newly discovered ore-body in the Bull Domingo mine,

DOLORES COUNTY.

According to the *Durango Herald*, Mr. C. E. Palmer, manager of the Grand View smelter at Rico, has advised the owners to shut down the works, and it is now understood that they have decided to do so.

EAGLE COUNTY.

[From our Special Correspondent at Gillam.]

As the end of 1888 draws near, bringing with it a severe winter, mining properties hereabouts are being placed in the proper shape for protracted work, assessments on the unpatented lodes are being performed, and altogether the indications point toward a season of renewed mining activity in Eagle County. All of the mines operated by the companies or individual owners have made a good record during the past year, while the lessees, by their energy and push, have developed properties heretofore regarded as valueless into paying ground. Before proceeding further I would like to explain the mode of occurrence of the three contacts, so as to render what follows intelligible. The gneiss forms the foundation, we might say, of Battle, Girard and Horn-Silver Mountains; thus, granite, quartzite and lime are the formations of which the county around about this mining district consists. In the Holy Cross mining district lying further west, we encounter nothing but granite, seamed with fissures or porphyry dykes. From this point the ledge assumes a more regular shape, and pitches rapidly eastward until within a mile of Eagle River, when the quartzite strata appears and covers it, so that by the time Girard Mountain is attained, forming the west side of the wall on Eagle Cañon, we have the eroded surfaces of lime, quartzite and granite. So on the Battle Mountain side. All three of these ledges now continue into Battle Mountain at a sharp angle until Horn-Silver Mountain intervenes, and the granite and quartzite disappear, the lime taking their places. Not as much labor has been expended upon the quartzite strata as we would have wished for; many of the mines either being tied up by petty litigation or undergoing a period of idleness, resulting from a lack of enterprise. But those mines of the quartzite which have been worked steadily, will bear the most rigorous inspection, for instance, the Polar Accidental, owned by Messrs. C. H. Taylor and G. F. Burrage, of Red Cliff; the Bleak House, owned by J. Sands and Robert Eaton, of Leadville; the little Belle Shaft, owned by the Iron Mask Company; the Rocky Point, owned by J. C. Fleischer, et al., of Denver; the Ground Hog, owned by the Ground Hog Company, and lastly the Champion, owned by Perkins, Hart & Co., of Council Bluffs. In all of these properties large and continuous bodies of a very high grade ore have been uncovered, lying in regular formed channels and dipping on an average from 33 degrees to 45 degrees into the strata. All of these mines have achieved a depth of 500 feet and beyond in places. On the other hand, we have the lime contact ore or carbonate mines. This strata lies immediately over and covering that of quartzite, though the pitch of the ore-bodies is steeper and the channels more irregular, causing the ore to take place in series of immense chambers. The mining in the lime has not been as deep, on an average, as is the case in the quartzite. The Iron Mask, Clinson, Spirit, Belden, and Black Iron are exceptions, and in each and every one of the above properties immense quantities of good carbonate ore have been extracted at different times, thus proving that the large carbonate belt in Battle Mountain and vicinity has not as yet been systematically prospected. Recently, some of the carbonate mine owners were tempted to explore the vast bodies of sulphides the mines contained, then generally presumed to be of a too low grade nature to pay for shipment, when, to their surprise, these sulphides proved to be the very best ore they possessed. It is evidently a fact, to the minds of many, that there occurs in the lime here two distinct ore channels or variable chutes, one above the other, and extending laterally into the hill. Now what was formerly admitted to be, by an expert, a stratum of dolomite lime separating the two bodies, turns out to be the richest mineral in the contact. Let this be an extra inducement to those carbonate people who have opened great bodies of these sulphides, which were supposed to be worthless, to redouble their energies and make a paying property of their now idle ones. Now we arrive at the fissure veins in the gneiss. These veins stand at the usual angle found in the fissures. They vary from 2 to 3 feet in width, solid ore, and widen as winzes are sunk and depth is gained in the headings. From the fact that the Warrior's Mark, the deepest and most developed vein of all, is enlarging, and the ore becoming richer as they go down, is sufficient warrant that these veins are little mints themselves. Some of the principal fissures are as follows: The Warrior's Mark, Rock Creek, Scorpion, Water Nymph, Golden Comet, Alligator, Copper King, Primrose, etc. The McDonald lease on the Little Bell, one of the Iron Mask Group, has made a noteworthy strike. Within the last two weeks an immense body of carbonate ore, which runs 40 per cent lead, 15 ounces silver, and ½ ounce gold, has been opened up. It is said to equal the Iron Mask mine itself. A lessee on the Bleak House vein has a flat chute in the quartzite leading away from the vein and the ore holds out. The Belle shaft has not as yet overcome the great volume of water in the incline, and from appearances one would imagine that they were draining a subterranean lake. If it does not prove to be the fore-runner of one of the largest ore-bodies ever opened in the quartzite, our predictions have failed very materially. The Champion people have erected a fine plant of new machinery, comprising a 20 horse-power engine and a 40 horse-power boiler. The Cheesman & Clayton shaft have put on a small hoisting plant, for the depth

is too severe for fast windlass work. Mr. D. Maxwell and others have opened up a good chute of carbonate ore on the old Silver Wave. I will say something of Taylor Hill Mining District next week.

GARFIELD COUNTY.

GRAND RIVER COAL AND COKE COMPANY.—It is reported that a new vein of coal, 16 feet thick, has been discovered on this company's property on Elk Mountain. It is also said that the coal on this vein so far as it has been developed partakes largely of the nature of anthracite.

LAKE COUNTY.

It is stated that a company has been formed to work the Slater process for the electric chlorination of gold and silver ores. The process will be applied to the low-grade zinc ores of Leadville, and works will be erected immediately.

LEADVILLE CONSOLIDATED MINING COMPANY.—Owing to the illness of the president no meeting of the board of trustees has been held as yet; in the meantime work at the mine is entirely suspended, and propositions for the leasing of the property are being considered. The superintendent has sent to the New York office a statement showing that about 24 tons of ore recently taken out yielded \$31.81 per ton net, after deducting cost of treatment, etc. As this is higher than the usual run Secretary Cameron believes that it must have been taken from workings that were leased some time ago.

R. J. F. BARTLETT MINING, MILLING AND ORE-REDUCING COMPANY.—This company was incorporated in Denver on the 12th inst. by William C. Duvall, George T. Webb, and Daniel B. Holmes. The capital stock is \$600,000; shares, \$10 each. The principal place of business is at Leadville. Meetings of the board of directors may be held in Kansas City.

SMALL HOPES CONSOLIDATED MINING COMPANY.—We are informed that work on this property progresses steadily and favorably. The value of the October output amounted to \$12,389, while the gross expenses, including considerable development work and the sinking of the new McCormick shaft, were \$8,000. About this ratio of profit has been maintained for some time past, and, according to Secretary Cameron, the company has a surplus of over \$50,000, which is to be preserved intact, and a dividend fund of about \$15,800, which it is hoped will be steadily increased.

LA PLATA COUNTY.

LA PLATA IRON AND COAL COMPANY.—This company, whose property is located near Durango, has struck its first vein of coal.

PARK COUNTY.

The mill of the Mudsill Mining and Milling Company, of Fairplay, has been leased to J. W. Van Horn, the late superintendent, who will start it up as a custom or concentrating works.

SUMMIT COUNTY.

LITTLE MOUNTAIN MINING AND MILLING COMPANY.—A judgment of \$511.40 has been obtained against this company, and the machinery has been levied on and will be sold at public auction at Breckenridge, December 10th, at ten o'clock A.M.

ROBINSON CONSOLIDATED MINING COMPANY.—Shipments will be considerably less this month than usual, the lessees of the No. 3 ore chute having been engaged in doing some important development work. Larger shipments will be resumed next month. The lessees of the G. B. R. claim, which includes the No. 3 ore chute, have made, it is said, quite a large amount of money out of it already, and the lease has several months yet to run.

DAKOTA.

Placer mining is being prosecuted in the deep diggings of various portions of the Hills on no insignificant scale. A great deal of gold has been taken out of the placers during the spring, summer and fall of this year. The miners are now generally engaged in "drifting" and piling the pay dirt up to be washed in the spring. A correspondent of the *St. Paul Pioneer Press* says that there is in course of formation an organization, the purpose of which is to open up the deep diggings of Castle Creek gulch, believed by all old miners to be quite rich in placer gold, but which, owing to the necessity of great outlay in draining off the water, have never been worked. Many miners have for twelve years past washed the bars bordering the stream, and in several instances large amounts of gold have been taken out. Should the necessary capital be enlisted to drain the ground it is expected the output of Diamond, Gold Run, Bobtail and Blacktail in the Northern Hills in 1876-77 will be equaled.

IDAHO.

The case of H. E. Wolfe against Thomas J. Burke for 20,000 and interest, alleged to be due on the sale of a placer claim in Idaho Territory, in 1885, was terminated in the first division of the District Court at Denver, Colo., on the 15th inst. The jury brought in a verdict for the defendant, sustaining Mr. Burke's plea that the \$1450 paid on the property three years ago was to secure an option and not to seal the trade.

SHOSHONE COUNTY.

BUNKER HILL & SULLIVAN MINING COMPANY.—The machinery now being furnished by the Risdon Iron Works of San Francisco is on the ground and being set up. The plant consists of a Duplex air compressor and Pelton water wheel. In connection with the air compressor the National drill will be used, being its first introduction in Cœur d'Alene. An important addition to the mill will be the erection of a Bulky injector condenser.

INDIANA.

There was a brilliant natural gas display near Wabash on the 17th inst., the gas having been brought within two miles of the city limits in the pipe line which is to supply Wabash. Only two wells were turned in. The line was to be completed this week. This will be the third city in the State to pipe gas from a distance.

KENTUCKY.

BARREN COUNTY.

A number of small wells have recently been put down in this county, and the quality of the oil produced is said to be good. The railroad running nearest to this field is the Louisville & Nashville, but that line is some distance from where the wells now in operation are located. It is the intention at once to build tanks and a pipe line connecting with a station on the line of the road.

LOUISIANA.

Another attempt is to be made to utilize the valuable deposit of sulphur found, many years ago, in Calcasieu parish, near New Orleans, says a correspondent of the *Chatanooga Tradesman*. A quicksand exists immediately above the sulphur, and how to sink a shaft though it has been a problem not yet solved. In 1870 a company of French engineers organized a company and sunk a great deal of money, but without reaching the sulphur. Another company subsequently tried the same experiment and also failed. Mr. A. M. Van Slooten, Mining Engineer, of New York, has organized a company of British capitalists to purchase the mine for \$225,000. New operations will be inaugurated on a much grander scale than previously attempted.

MAINE.

MOUNT MICA MINING COMPANY.—This company has postponed further explorations for gems at Mount Mica until another season. A large amount of top-rock above the mineral streak has been removed, and work has now been suspended until next May, when developments of interest to mineralogists may be expected.

STATE OF MAINE SLATE COMPANY.—This company has leased for a term of years the quarry which the Blanchard Slate Company opened and tested some years ago, but suspended development until the connection of the Piscataquis Railroad and the Megantic Railway could be ascertained, and this connection is now made.

ANDROSCOGGIN COUNTY.

The mineral paint mine of the New England Paint Company, Lisbon, is doing well and the paints are turning out better than had been expected. The works are running extra time and grinding out paint in large quantities.

HANCOCK COUNTY.

Blue Hill seems to be peculiarly rich in minerals. At Norse Point, about two miles from the village, a large deposit of chalk has been found. At the Mineral Springs a paint mine has been found. Five colors have been obtained from it. Good marble is also found there.

MICHIGAN.

The Cleveland Iron Mining Company has raised wages of employes. The Calumet & Hecla Mining Company will also raise wages soon. The prospect is said to be good for a general increase of wages for skilled and unskilled labor in the iron and copper mining districts.

NANAIMO MINING COMPANY.—The property of this company, at Iron River, was sold at auction recently to satisfy numerous judgments against the company.

PERINSULAR GOLD MINING COMPANY.—This company has been organized in Detroit, with a capital stock of \$2,500,000; shares, \$25 each. The lands of the company comprise 40 acres in Marquette County, near Ishpeming, near the Ropes mine. Mr. R. A. Trombten, of Ishpeming, will be the captain of the mine, and work will commence at once. The officers are: President, Francis T. Palms; Vice-President, Wm. B. Moran; Secretary and Treasurer, Fred T. Moran.

COPPER MINES.

CALUMET & HECLA STAMP MILLS.—The mills are situated on Torch Lake, about twenty-five acres of land being occupied with the different buildings, docks, yards, etc. Of the mills proper there are two, the Calumet, which is said to be the largest single dressing plant in the world, covering as it does 1½ acres. During the past season it was very largely added to, its dimensions now being as follows: Length, 460 feet; width, 105 feet; height, 66 feet. There are three annexes to the mill on the east side which contain the slime plant, each being 100 feet wide, two being 75 feet deep and the other 50 feet.

The mill is now operating eight head of stamps and three new heads are being erected, which will make eleven in all. There are now 272 jigs, and when the three new stamps are running, 102 new jigs will be added, making 374. There are now 28 slime tables used; 16 new ones will be added to the plant on the completion of the new stamps. Two Heberle mills for recrushing a coarse gangue discharged from the rough sieves and riggers, are also used.

The Hecla mill building is 300 feet long, 105 feet wide, 66 feet high. This building has two annexes 100 feet wide by 70 feet deep, one being erected during the past season to contain the slime plant. In this "Hecla" mill seven head of stamps and 238 jigs are worked. Twenty-eight slime tables will probably be running before the close of 1888. The slime tables are all double-deckers and have been shown to yield 60 per cent more ingot

from the same amount of slime, than tables using a dead-head. There are also two Heberle mills. Up to about a year ago the mineral was forwarded from the stamp mills to the smelting works in barrels. During the past year, however, this method has been greatly improved upon by the Calumet Company, and it is now sent in cars built for the express purpose. These cars run into the stamp mill and are loaded, running from there directly into the mineral storehouse at smelting works over an elevated track, and dump their load into bins. This method is not only much quicker, but also saves the handling of the heavy barrels, and does away with the use of some 4000 barrels per month, the number formerly used to transport the mineral to the smelting works. Ten cars are used to transport the mineral from the Hecla mine and 15 from the Calumet. Cars hold about five tons each. The cars which convey the rock from the mine run into the mills over an elevated track, dumping their load into the rock bins, the bin capacity of the two mills being some 10,000 tons. At present, the mills have a capacity of stamping some 3200 tons rock per day. With the additional stamp mentioned above they can easily handle 3900 tons.

Recently a solid anvil has been placed under No. 1 Calumet head, and the head is now stamping some 260 tons per day without increasing steam formerly used, showing an increase of some forty tons over the same heads when using spring timber as a foundation.

The stamp-mill boiler-house is 210 feet long, 70 feet wide, and at present contains ten fire-box boilers, the house having a capacity for fourteen, the steam being conveyed to the mills by means of a twenty four-inch pipe running through a seven-foot tunnel. The feed plant consists of two Worthington feed-pumps, 12 by 6 by 10; also one Hyatt eight-foot filter with a capacity of 200,000 gallons every 24 hours, which is the amount of water the boilers are now evaporating. There are two sand wheel buildings, about 60 by 60, each containing a sand wheel 43 feet in diameter, and having a bucket width of 6 feet. All the water and sand passing through the mills is lifted to a height of 35 feet into a four-foot launder, and conveyed into Torch Lake.

In the water-works building there are three pumping engines, "Huron," a horizontal pump geared back onto a horizontal engine, capacity, 20,000,000 gallons, this engine being used as an auxiliary engine. "Ontario," vertical double expansion compound pumping engine, nominal capacity, 20,000,000 gallons, but is now pumping 23,000,000. "Erie" pumping engine, same general type as "Ontario," capacity, 10,000,000. Making aggregate capacity, 50,000,000 gallons every 24 hours, the mills are now daily using about 33,000,000. Piles are now being driven for the foundation to extensive addition to the water-works. This addition is designed to contain two vertical triple expansion compound pumping engines having a pumping capacity of 40,000,000 gallons each every 24 hours; the foundation for this new building will be laid early in the spring. When the new pumps are set up the water-works will have a pumping capacity of 130,000,000 gallons each 24 hours. Of this amount the mills will probably use about 60,000,000 gallons. The plant is duplicated for the sake of safety. The engines, stamps, sand wheels, boilers, etc., were all designed by Mr. E. D. Leavett, Jr., the company's consulting engineer. At present the boiler plant for the water-works consists of two 90-inch fire-box boilers, 34 feet long, carrying a pressure of 120 pounds; two boilers of the same size, but to carry a pressure of 180 pounds, are to be added. There are excellent docks at which the largest vessels can unload, and these docks are to be largely added to during the coming season.

QUINCY MINING COMPANY.—This company has withdrawn its suit against the Pewabic Mining Company for the right of way across the Pewabic property, owing to some informalities in the petition.

TAMARACK MINING COMPANY.—The following figures of this mining company's operations and financial results for the first quarter of the current fiscal year, comprising the three months ended September 30th, have been published by the *Boston Transcript*:

The product of refined copper was 2,787,765 pounds, from which was realized the gross sum of.....	\$370,194.10
Interest receipts.....	1,858.17
Total gross receipts.....	\$372,052.27
Running expenses at mine.....	\$117,864.52
Smelting, transportation and other expenses.....	48,973.37
Total expenses.....	\$166,837.89

Leaving mining profit.....	\$205,214.38
Dividend, \$5 per share on 40,000 shares.....	200,000.00
Surplus for the quarter.....	\$5,214.38

The figures show about 13½ cents per pound received for copper in the quarter; about six cents per pound for expenses of producing, treating and marketing, but not including construction account. Expenses are somewhat larger than they are likely to average for the whole year.

Speaking of Tamarack, we hear later particulars about the probable development of section 11 of the company's property. It now appears, from a survey of the land, that the lode will be struck by the two new shafts which it is proposed to sink not more than 3500 feet below the surface. The section is particularly adapted for early mining operations, being cleared of brush and timber, and work could be begun almost immediately. All that is needed is the building of a road for the transportation of materials and supplies. It is not out of the question that work will

begin next spring, as soon as the frost is out of the ground. Captain Daniell, superintendent of the Tamarack, Osceola and Kearsarge mines, will be in Boston soon to talk over this project in connection with other business relating to the various Clark-Bigelow properties.

TOLTEC CONSOLIDATED MINING COMPANY.—It is reported that arrangements are being made for the reorganization of this company, which at one time was a large producer of copper. The first work of the new organization will be to more thoroughly explore and open Minnesota vein, which is said to run across the property.

[From our special correspondent.]

HURON.—I learn that the ground south of No. 10 at the 4th level, which up to date has been rather poor, has changed, and is now showing up rich rock, in fact the whole mine is looking well, the output is increasing and bids fair to continue to do so. The mine has a very large amount of territory on the vein. All the shafts can be sunk on the incline of the vein to a depth of many thousand feet on the company's property.

J. H. CHANDLER VS. CALUMET & HECLA MINING COMPANY.—In the Circuit Court of the United States for the Western District of Michigan, the case of Chandler vs. The Calumet & Hecla Mining Company came on for trial before a jury November 13th and 14th, Hon. H. F. Severens, District Judge, presiding. The action was ejection for the S. E. ¼ of N. W. ¼ of Sec. 23, Town 56, N. R. 33 west, in Houghton County, Michigan. This land lies close to the outcrop of the Calumet lode, the lode underlying the whole of it.

The plaintiff claimed the land under a patent issued by Michigan to him November 3d, 1887, describing the land as swamp land.

By the act of Congress of September 28th, 1850, the United States gave to Michigan and other States the whole of the swamp and overflowed lands, made unfit thereby for cultivation within the State, and made it the duty of the Secretary of the Interior to make accurate lists and plats of all such lands, and transmit the same to the governor of the State, and at his request to cause patents thereof to issue to the State conveying to it the fee simple of such lands.

Michigan, by act of its Legislature of June 28th, 1851, accepted the grant and adopted the notes of the U. S. Surveyor as the basis upon which they would receive the swamp lands. The Surveyor General in Michigan, under the legislation and letters of instructions, caused plats to be made in accordance with the filed notes, and made lists of the swamp lands, including those in the township mentioned, and transmitted the same to the United States land-office. This list did not contain the land in question, and the list was approved by the Secretary as above mentioned.

The plats so made by the Surveyor-General from the field notes were lodged in the Michigan land-office at Lansing. The plat of this township showed a number of hills in pencil upon it, supposed to have been drawn in accordance with their instructions, and a number of parcels marked "S" in pencil, and among those appearing to be marked was the land in question.

The plaintiff claimed that the land in question being marked "S" and being more than half within pencil lines so drawn was swamp land, although never listed by the Surveyor General, and never listed as such by the Secretary. He claimed further that the evidence by witness was competent to prove that the land in question was in 1850 swamp land in fact and offered such evidence.

The Michigan act provided that patents should be issued by the State of the lands selected by the State agents.

The defendant introduced deeds and records, showing itself the owner of the land in question by intermediate conveyances from the first patentee of the State.

At this stage of the proof the presiding judge directed a verdict for the defendant, holding, 1st, That the plaintiff had shown no title to the land in dispute, because the selections of swamp land approved by the Secretary did not include it, and that the alleged pencil lines and notations were no evidence of the character of the land, and that the parol evidence of the character of the land was not admissible against the Secretary's selection and determination, shown as above.

2d, That in addition the defendant's title derived as aforesaid was perfect.

NATIONAL.—My latest information is to the effect that the mill would start up by the 20th of the present month. There has been little done for a long time past in the way of production, but they have been building their stamp mill and opening up new ground, so that when they were ready to run they could make a good showing. The mill has one head of stamps, and I learn, on good authority, that the mine has a very valuable stock pile ready for stamping, which will enable it to lay down copper very cheaply, especially so for some months to come. The National, as yet, not having sold its product to the syndicate, will obtain the full market price of 16½ cents per pound for some time to come at least. It is estimated that the mine can produce 100 tons of mineral per month, which will go 80 per cent in lot.

TAMARACK.—The lode at No. 1 shaft never looked better than at present. The deeper the mine is worked the richer is the quality of the rock. No. 2 shaft has now been sunk to a depth of about 1800 feet. A new engine house is being erected at No. 2 shaft, 44 feet by 75 feet. The engine which is now being built will be delivered early in the spring. The engine house will also contain a drum 80 feet in diameter. Several new dwelling houses and a clerk's office will be erected on the location.

TAMARACK, JUNIOR.—The work of sinking the two shafts at this mine is proceeding steadily downward. No. 1 has now reached a depth of about 345 feet, and No. 2 a depth of some 280 feet. The location is the scene of a good deal of activity in the building line just at present, as everything is being hurried along preparatory to the coming of winter. During the last few months 23 dwelling houses have been built and are now all occupied. A schoolhouse is now being erected which will shortly be ready for occupancy. No. 1 shaft has been covered in, and the work of covering in No. 2 was about completed when we were at the mine Saturday. A new dry-house was also about finished; the old one is to be turned into an office. There is a new engine-house at No. 1 shaft, the outside work on the house is finished and the foundation for the new engine was being laid; the work will be finished the present week. The engine is to be 24 x 60. The new boiler-house, which is to hold three boilers, is completed and one of the boilers will be set up shortly. The foundation for a building, which, for the present, is to contain a blacksmith, carpenter, and machine shop, is up, and the frame about ready to raise. In sinking the shafts several amygdaloid beds, that carry a good showing of copper, have been cut.

MINNESOTA.

VERMILION PINE, IRON AND LAND COMPANY.—It is stated that this company, which owns 17,000 acres of land in Itaska, St. Louis, and Lake counties, will resume operations within a few months. The officers of this company are: C. H. Hall, of Ishpeming, President; Capt. John Duncan, Vice-President; and Capt. Sam. Mitchell, Secretary and Treasurer.

MONTANA.

GALLATIN COUNTY.

Work has commenced on thirteen new ovens at Cokedale, which, when completed, will make a total of forty. These turn out an average of a ton of coke a day. The ovens are built to take charges of five tons each, and the coal is allowed to burn seventy-two hours. Coke can be made in less time, considerable having been made by burning the coal forty-eight hours, but it has been found that the coke made in seventy-two hours, where a lighter draft is used, is of superior quality. The *Bozeman Courier* states that arrangements are being made at the mine to run a new slope 400 feet in depth. This will make 625 feet, as the slope is already in 225 feet. This slope will be run on what is called the "Foreigner" vein at Timberline; in other words, the middle vein. It is contemplated when the slope is completed to work the upper or "Bonanza" vein also, as some of the coal in this vein is said to make good coke. The lower vein is not worked, as its coking qualities do not equal those of the two upper strata. About 100 men are now on the pay rolls of the company.

LEWIS & CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The official report issued shows that the production for October amounted to \$70,800, and the working expenses to \$40,100.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—At this company's works, at Meadville, a boiler exploded on the 19th inst., killing four men and fatally injuring four others. The boiler that exploded was one of the battery of four, and in three of the boilers the steam gauge indicated 75 pounds pressure. The other one indicated 55 pounds of steam. One of the employes states that the steam was evidently turned into the boiler that exploded from the others, thus giving 200 pounds additional pressure when it rent asunder, one half going forward and the other backward.

NEVADA.

ELKO COUNTY.

NEVADA QUEEN MINING COMPANY.—The shipment of \$30,000 from this mine on the 12th inst. was the clean-up, and makes the total production of this run of the mill \$180,168.57. The mill is now at work upon Navajo ore.

LANDER COUNTY.

BRAMHALL MINING COMPANY.—This company has been organized in Portland, Maine, with T. P. Shaw as President, Geo. C. Burgess, Clerk, and George H. Libby, Treasurer. It has a capital stock of \$300,000. Prof. F. L. Bartlett and Mr. Geo. H. Libby are about to visit the copper property of the company situated near Austin, and if they are satisfied with the prospects vigorous mining operations will at once be commenced.

NYE COUNTY.

BARCELONA MINING COMPANY.—The Barcelona mine, in Spanish Belt district, continues to yield the usual quantity of good ore, and the Monitor-Belmont mill is running on ore from this mine.

STOREY COUNTY—COMSTOCK LODGE.

We condense the following from the *Virginia City Chronicle*:

Numerous copper locations have recently been made on the range of hills marking the northern boundary of Seventeen-mile desert, east of Virginia City. The locators exhibit specimens that assay 40 per cent in copper. As there is some doubt whether the copper veins are located in Storey or Churchill counties, a surveyor will be called into requisition to determine it.

BENTON MINING COMPANY.—Official advices state that the company will set up a steam hoist plant over the shaft on the mine next month and resume explorations on an extensive scale. The Benton shaft is sunk to a depth of 900 feet, and, being in solid ground, is

in fair order, requiring but a small outlay for re-timbering the upper part to put it in shape for exploring the mine through it far more conveniently and at less cost than through the Alta shaft, as heretofore.

CONFIDENCE MINING COMPANY.—The following directors were elected: George D. Edwards, J. H. Dobinson, Coll Dean, Maurice Schmitt and M. W. Fox. The superintendent's report contains the following information of interest: From the present appearance and condition of the mine we hope to be able to continue our usual shipments of ore to the mill for some time to come. The gross bullion yield of the mine for the fiscal year was \$283,375.33, of which \$174,720 was disbursed in dividends.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—During October there was a total of 12,735 tons of ore crushed yielding bullion of the assay value of \$339,814.45, of which \$147,200.67 was gold and \$192,613.78 was silver. The average yield of the ore in bullion per ton was \$26.68, and the average assay value of the battery samples was \$29.61 per ton. The company is concentrating a large amount of sulphurets from tailings flowing from amalgamating pans in the California pan mill. There is a length of fully an eighth of a mile of blanket sluices east of the mill over which the tailings flow for a certain time. The flow is then turned off from one of the compartments of the sluices and a stream of clear water turned on to wash off the light sand, leaving the sulphurets clinging to the fiber of the jute covering of the sluices. After the sand is carried off men with brushes sweep the sulphurets into tanks at the end of the sluices. The sulphurets are then hauled by teams and carts to a level tract of ground several acres in area convenient to the mill, where they are handled over until dry, when they are ready to run through the pans. Several tons of sulphurets are saved daily by this process, the bullion proceeds of which is the property of the mill owners.

OCCIDENTAL MINING COMPANY.—At the annual meeting of the stockholders, held in San Francisco on the 5th inst., the following officers were elected: Geo. R. Wells, President; Joseph Marks, Vice-President; A. K. Durbrow was re-elected Secretary, and D. B. Lyman Superintendent. The report of operations during the year contains the following information of interest: There was extracted from the mine 3831½ tons of ore which has been milled at custom mills and also by the company, yielding bullion of the assay value of \$52,624.75, of which amount \$14,805.55 was in gold and \$38,019.20 was in silver, the average yield being \$13.73 per ton. Two assessments were levied during the year, aggregating \$45,000, making the total receipts \$91,500. This company produced bullion in October valued at \$9475.06. The mine will soon be on a self-sustaining basis.

NEW MEXICO.

GLORIETA COPPER COMPANY.—Failure to file articles of incorporation involved this company in legal complications and caused the closing down of the works. These articles have now been filed, and an attempt at settlement is about to be made.

GRANT COUNTY.

SAN PEDRO MINING COMPANY.—In reference to our report of last week, concerning the injunction which has been granted, preventing the transfer of the San Pedro Company's property to the Santa Fé Copper Company, which, it is alleged, is a "bubble" corporation, Mr. Geo. W. Ballou said to an *ENGINEERING AND MINING JOURNAL* representative: "This will not prevent the proposed reorganization." Mr. Ballou could not be induced to say anything further than this. A press dispatch of the 16th inst. gives the following interesting history of the case: The San Pedro and Cañon del Agua Company was incorporated in 1880 with a capital of \$10,000,000, and was largely a Boston concern. It is held in two counties of New Mexico. One hundred thousand acres of land on which is located a copper mine, said to be the most valuable in the territory. The company was organized in 1885 under the name of the San Pedro Mining Company, and the stock scaled down to \$2,000,000, of which half was common and the balance preferred stock. The stockholders have received no dividends.

President Ballou of the company recently sent out a circular to the effect that a company known as the Santa Fé Company had been organized with a capital of \$5,000,000, unassessable, to which it was proposed to transfer all the rights and properties of the San Pedro Mining Company. The holders of San Pedro stock were to receive for each two shares of preferred or four shares of common stock one share in Santa Fé stock, the value of the latter being placed at \$4. Although Morse claims this to be excessive, it was to prevent this transfer that Morse for himself and others brought a bill in equity.

NORTH CAROLINA.

[From an Occasional Correspondent.]

CLEVELAND COUNTY.

King's Mountain tin deposits are being very cautiously developed under the direction of Dr. Ledoux, of New York. They have some cassiterite on the dumps ready for shipment, and hopes are entertained that North Carolina will be the first producer of tin for the market in this country.

MONTGOMERY COUNTY.

SAM CHRISTIAN.—This mine is the seat of the largest hydraulic operation in the south, and is an illustration of what English capital will risk. In the past six months over one thousand tons of machinery have been hauled in (40 miles) and erected. It consists of five 100-horse-power boilers, two Worthington pumps,

two and one half miles of 20-inch pipe, etc., all of which is for the purpose of delivering 5,000,000 gallons of water a day from the Yadkin River to an elevation of 420 feet on the property. From thence it is distributed in smaller pipes and flumes to different parts of the several hundred acres owned by the Sam Christian Gold Mining Company, of London, England. Aside from other work they have cut and stacked 5000 cords of wood as fuel. These expenditures with the purchase of the property must foot up over \$250,000. The plant has been in operation about ten days. Mechanically it is a success. The financial feature will be known when the first clean up is made. No doubt there are good auriferous deposits on the property with some very rich quartz, as both that and the nuggets weighing from nine pounds to dust have been found in quantities. There are some doubts entertained as to whether the large outlay is warranted. If they are unsuccessful it means another "black eye" for North Carolina, when rightfully the "black eye" should be given the parties who advised the outlay.

RANDOLPH COUNTY.

HOOVER HILL GOLD MINE.—This also is owned in London, England, and for the past five years has always paid something every month over expenses. Their last shipment was one hundred ounces. For months at a time they have run their twenty stamps on ore that yielded \$10 to the ton.

PENNSYLVANIA.

Owing to the resumption of so many furnaces recently, the extensive Jones iron ore mines have taken back all of their old employes, and now have a larger number at work than ever before.

DUNBAR SAND COMPANY.—This company has been organized with a capital of \$100,000. Among those interested are James Atwell, C. H. Jackson, C. M. King and E. S. White. The company controls a large tract of valuable flint sand at Dunbar. Recent quarrying shows that there is also a large quantity of blue limestone in this territory. The Dunbar quarries were worked many years ago by farmers and a local company, but they were never developed properly until this company obtained control. The present owners have spent a large sum of money, and will expend much more in improvements.

COAL.

The sheriff of Allegheny County, Alex. E. McCandless, will sell a number of bituminous coal tracts in Union township, together with certain mining machinery, fixtures, and privileges, on December 3d, at the Court House, Pittsburg.

At a meeting of river coal operators, held at Pittsburg, on the 19th inst., it was unanimously decided to shut down all the mines along the Monongahela River for an indefinite period. The operators say the shut-down will be for two months at least. The unprecedented high water has caused the shipments to be unusually heavy, and coal men say in that no previous season has so much coal been mined, and they cannot sell coal to advantage now, as the market is overstocked, and coal is selling for 5 cents per bushel, the lowest for many years.

A movement has been started by the miners of Lackawanna and Wyoming regions toward an increase in their wages. This is in the direction of a reduction in price of powder, for which the miners have for years past been paying \$3 per keg. The Delaware & Hudson Company has agreed to reduce the price to \$2 per keg, provided the other companies will do so. This was told to a committee representing the miners of that company between Carbondale and Plymouth, and accordingly committees are being organized to see the officials of other companies.

CONNELLSVILLE COKE AND IRON COMPANY.—A sale has been made of a controlling interest in this company to the H. C. Frick Coke Company. The plant is the largest in the Connelville coke region, and embraces 9000 acres of coal land, 1800 coke-ovens, and miles of railroad track.

CONTINENTAL.—This colliery, which has been idle since the 9th of January, 1885, will soon be in readiness to resume operations. The inside workings are being cleaned up, and the breaker is undergoing a general overhauling.

COKE.

MCCLURE COKE COMPANY.—The Union Coke Works at Stonerville, has been sold to this company, and the eighty-five ovens controlled by that organization are now in operation under the superintendence of P. P. Glenn.

RHODE ISLAND.

[From an Occasional Correspondent.]

The Worcester Steel Company having purchased the Portsmouth coal mines in this State, are unwatering them and shipping coal to their works in Worcester, Mass. They are making every preparation to mine from one to two hundred tons per day.

John Moore has erected a crusher at the Cranston coal mines near Providence, and is selling his product with some success.

UTAH.

Prof. Marcus E. Jones, who has recently spent some time in looking over the Pleasant Valley and Thistle asphaltum deposits, states that as there is no asphaltum on the west side of the range of any consequence, the works there have shut down, and there is no prospect of any profitable working, although the company has put out \$30,000 in a plant. The fissures are there in the rocks, but there is little stuff in them, yet further east there is asphaltum in much greater abundance, and may prove a source of large profit when opened up. The crude article is the most profitable of all, as Gilsomite is almost entirely on the sur-

face. In our last issue we referred to the organization of a company which proposes to work asphaltum beds in Emery and Uintah counties.

BEAVER COUNTY.

HORN-SILVER MINING COMPANY.—As stated in previous issues of the ENGINEERING AND MINING JOURNAL, the mine will be examined shortly by a competent expert; until then, we are informed, there will be nothing of interest to make public.

TOOELE COUNTY.

HONORINE MINING COMPANY.—Work on the tunnel on this mine has been suspended because of the low price of lead.

VIRGINIA.

TAZEWELL COUNTY.

CHURCH VALLEY COAL AND IRON COMPANY.—It is stated that this company has discovered a twelve-foot vein of coal on its lands, near Richmond, and is now at work sinking a shaft at the point, with a view to the development of the discovery.

WASHINGTON TERRITORY.

KITITAS COUNTY.

Considerable deposits of copper have been lately discovered in this county. A sample of silicate of copper from a claim near Ellensburg, where the owners state that there is three feet of ore between walls, has been assayed with the following results:

Table with 2 columns: Substance and Percentage. Oxide of copper 47%, Sulphur 1.37%, Oxide of iron 5.29%, Lime .44%, Silica 33.79%, Water and carbonic acid 12.08%, Alumina .20%, Total per cent. 100.00%, Baryta .04%, Arsenic .19%.

The actual amount of metallic copper is 36.90 per cent.

WEST VIRGINIA.

VIRGINIA & NORTH WEST RAILROAD COMPANY.—This company, which has just been granted a charter, has a capital stock of \$1,000,000. The privilege is reserved to increase the capital to \$3,000,000, if so desired. The railroad which it is proposed to build is to commence at or near the mouth of Coal River, in Kanawha County, and to run from there by the most practicable route to Guyandotte Mountain, in Boone County. This road will open up a territory rich in coal and minerals, and one of the best lumber regions in the State.

FOREIGN MINING NEWS.

AUSTRALIA.

NEW SOUTH WALES.

BROKEN HILL MINES.—Mining in this now famous district seems to be carried on under great disadvantages and with great discomfort owing to the scarcity of water. There is a large population without water in or near the camp. The liquid, which can hardly be termed water, is obtained from a muddy creek eight miles off, and the price is not less than 75 cents a bucket. Typhoid and inflammation of the lungs are on the increase. The production of bullion continues on a greater scale than ever, and the reserves of ore are very large.

BELGIUM.

A cablegram dated Brussels, November 14th, states that an explosion of fire-damp occurred in the Frederick pit, at Dour, in the province of Heinnault. Thirty-two miners were killed. At the time of the explosion there were thirty-five men in the pit, and out of this number only three escaped alive. The three survivors are all more or less injured.

CANADA.

PROVINCE OF NOVA SCOTIA.

EASTERN DEVELOPMENT COMPANY.—The work now being done by this company on the "Coxheath" property is showing large bodies of chalcopryrite ore. Recent advices show that the anticipations of the existence of extensive veins of this ore are being rapidly realized, while the surface work of the western extension of the lode, known as the "Argyle" mine, which was lately purchased, is thought to demonstrate the continuance of the same veins that are now being worked on the original area.

PROVINCE OF ONTARIO.

[From our Regular Correspondent in Algoma.]

CANADIAN COPPER COMPANY.—The property of this company is situated near the town of Sudbury, Ontario, and embraces several square miles in area. At present, but three of its mines are being operated, viz.: The Copper Cliff, the Evans and the Stobie, whose output of smelting ore for last month was close upon 4500 tons. The output of ore from Copper Cliff, the deepest working of which is almost 300 feet, was 1560 tons of 12 per cent copper, or about 180 tons of metal broken by 16 miners, an average of 11 tons of metal for each miner. Nor is development work neglected. Three cross-cuts and two drifts at this month being pushed ahead vigorously.

The Evans output was about 1000 tons. Comparatively little work is being done here, as the compressor is not yet working. The rock house is unrivaled in Canada.

The Stobie output is fully 2000 tons, at a cost of less than 50 cents a ton, delivered on the cars. The quantity of mineral here is apparently inexhaustible.

At Copper Cliff the smelting-works are located. The smelter building is already covered, and the smelter itself will soon be in position.

The trestle-work over the roast heaps is fully two-thirds of a mile in length and is now ready for track-laying. The smelter tracks are in use, and in less than a month the 100-ton furnace will be blown in. Twelve

thousand tons of ore are now in process of roasting. Dr. Peters, well known to all readers of the JOURNAL, and who doubtless is the ablest copper metallurgist on this continent, is the general manager. Capt. Frank Andrews is the general superintendent, and his extensive practice serves him well in mining and handling the deposits of this district. Mr. John Grigg, late master mechanic of the Tamarack mine, fills the same responsible position here. Mr. Frank L. Sperry, late of Yale College, is the chemist and assayer. Each department appears systematic and orderly.

THE VERMILLION.—This mine closed down on the 1st inst. This is said to be "a weak invention of the enemy," or, in other words, a game of "freeze out," it being well understood that the discoverer cannot meet the unnecessary assessments levied upon him. This is an ore-deposit comprising a great variety of minerals and two analyses resulted in five ounces of platinum to the ton. Nuggets of gold have also been extracted from this interesting deposit, while the amount of nickel in the ore from special tests made in Toronto for your correspondent resulted in from 17 to 30 per cent. of nickel. But, notwithstanding all this rare combination of the "economic and ornamental," work is closed down pro tem., and the poor prospector is left to reflect on the possibility of his having too much of a good thing.

CENTRAL AMERICA.

COLUMBIA.

The latest issue of the *Anales de Ingenieria (Engineering Annals)*, published at Bogota, furnishes some interesting information concerning the output of precious metals in Colombia. From 1753 to the end of 1887 there was received into the mint at Bogota 166,307 kilos 570 grammes of gold, equal to \$99,586,623, and 279,620,965 kilos of silver, equal to \$12,674,418. These figures may be regarded as a fair average of the output of all the national mints. The total showing is that, between 1753 and 1887, the enormous sum of \$343,901,470 in gold alone was won from the mines of Columbia, while the silver product reached \$43,482,726. It is also to be noted that during all that period the number of miners employed at any one time never exceeded 8000, and that they worked, moreover, according to the old system in use at the time of the Conquest, and also that frequent interruptions occurred in times of war, when the miners were transformed into soldiers.

GREECE.

During the year 1887 the exports from the mines of Laurium have amounted to 62,266 tons, of which 59,487 tons were ores of every kind and 2779 tons of pig lead. There were only 47,972 tons in 1886. The increase in favor of 1887 reaches 14,294 tons, and is exclusively in ores. The exports of pig lead have diminished by 202 tons. The gross profits amounted to 1,901,301 francs, as compared with 1,813,872 francs for the preceding year.

INDIA.

MADRAS.

In the Madras Presidency, over and above recent finds of gold and diamonds, says *Indian Engineering*, it is now reported that silver in extraordinary abundance has been discovered in the Chitaldroog district. The reefs, of which there are several, yield nearly a quarter ore, which has been assayed by Messrs. Johnson and Matthey, of London, and gives 42 ounces of silver and an appreciable quantity of gold as well as 200 pounds of lead to the ton. Specimens of these minerals are now to be seen in the Bangalore Museum, and several tons of rich specimens are to be sent to the Exhibition at Mysore.

MEXICO.

CANDELARIA CONSOLIDATED MEXICAN MINING COMPANY.—This company has been organized to operate in the State of Durango. The officers are: Columbus Waterhouse, President; C. P. Waterhouse, Vice-President; C. S. Givens, Secretary; D. M. Burns, Superintendent. The capital stock is \$12,000,000; shares, \$100 each.

DON ENRIQUE MINING COMPANY.—The financial position of this company at this date is as follows:

Table with 2 columns: Description and Amount. On deposit, October 31st \$56,010, Cash remittance 5,465, Ore shipments, estimated 3,780, Total, United States currency \$65,255, Add exchange, 33 per cent. 21,534.

Table with 2 columns: Description and Amount. Total, Mexican currency \$86,789, October 20th, due Chihuahua Bank 84,012, Credit balance \$2,777.

[From our Special Correspondent.]

CHIHUAHUA.—I extract the following particulars from the report of the government engineer, D. Gaspar Salas upon the new gold discoveries near Batopilas.

The district of the Cerro Colorado is N. 10° W. of Batopilas and at a distance of 10 kilometers in a straight line. 16 kilometers (10 miles) by the mule trail. The prominent part of the Cerro Colorado (Red Mountain), in which the deposit is found, is formed of a feldspathic mass charged with silicate of magnesia and irregularly traversed by veins of various sizes of oxide of iron and green steatite. These latter substances diminish in quantity as the workings advance into the mountain.

The gold is met with in the lower part of the feldspathic mass irregularly disseminated all through it, but it exists in greatest abundance in the ferruginous veins, and particularly in the steatite veins. It occurs in the shape of very thin sheets, several of these generally adhering together in modules and in threads that are sometimes a centimeter in thickness (2 of an inch approx.). It has a fibrous look, is not very com-

pact, and appears to have been deposited by a chemical precipitation, bearing, as it does, some resemblance to precipitated copper.

In the interior of the deposit the oxide of iron and the steatite disappear, and the gold is more disseminated through the feldspathic mass in the shape of grains, threads, and sheets, ramified in form, of brilliant lustre, and presenting the hardness and consistency of melted gold. It is impossible to determine what proportion the gold bears to the entire mass of the deposits on account of the irregularity of its dissemination.

Although there have been eight claims located the only ones that give a positive result are the "La Gloria" and the "San Gabriel." On the other claims only a color of gold has as yet been found.

From the San Gabriel claim about 1500 tons of ore have been extracted in the last six months, divided into three classes. The first class ore gave 267 ounces of gold per ton; the second class ore gave 80 ounces of gold per ton, and the third class 2 1/4 ounces per ton. The average value of the whole amount of ore taken out, including all three classes, is stated to have been about 4.8 ounces of gold per ton. This ore has been reduced in ten mule power arrastras on the banks of a creek about two miles away from the mine.

The "La Gloria" mine produces ore with an average assay of 1.6 ounces per ton. What its production has been is not stated.

The inspector does not care to form any estimate of the quantity of gold which this deposit is likely to yield, as any such estimate would certainly appear exaggerated to those who have not visited the mine. He thinks, however, that the softness of the rock inclosing the gold, the high value of the ore, its exceptional abundance, the immense dimensions of the deposit and its favorable position between the two rivers, are circumstances highly favorable to the exploitation of the deposit in a more economical manner, and with approved appliances, and that if certain works which he recommends are carried out this district will become one of the principal sources of gold in the whole world.

In this city, Mexico, it is rumored that these mines have been sold for a high price to an English syndicate.

STATE OF CHIHUAHUA.

SANTA JULIANA MINING COMPANY.—This company, which was incorporated under the laws of the State of New York in April of this year, is re-working the old Santa Juliana mine in Chihuahua. A new shaft is being sunk to reach what is known as the Rouquillo vein, and is now down about 200 feet. A letter recently received at the New York office states that ore will probably be reached by Christmas. All the hoisting and mining machinery is upon the ground, and should the ore prove of low grade a stamp mill will be erected. The capital stock of the company is \$200,000, divided into 200,000 shares. Warner Van Orden is President and Treasurer, and E. B. Sexton Secretary.

LOWER CALIFORNIA.

The report of the government inspector gives us the following facts about the Boleo copper mines: The number of men in the month of March in the mining establishment was 1537; 586 being employed as miners, 519 in the smelting works, and the rest in miscellaneous work. The miners' wages average \$1.67 Mexican currency and those in the smelting works \$1.77. A narrow gauge railroad, 26 kilometers long, unites the Santa Rosalia group of mines with those of the Soledad. The mining work already done, the dwelling houses, the smelting plant and machinery erected, the railroad, pier, and other works have cost the company, it is said, \$3,000,000.

The production during the month of March is stated to have been 2000 tons of copper.

SOUTH AUSTRALIA.

A discovery of gold is reported from Kangaroo Island, and a specimen of the minerals has been forwarded to the commissioner. The prospectors were employed for four months in driving a number of shafts under the greatest difficulties; but with an increased knowledge of the locality and conditions, they were encouraged to prosecute their searches until they were rewarded with the discovery of alluvial gold. The island of Kawau, near New Zealand, has had its mineral resources considerably developed by Mr. Thompson, late of Victoria. Copper, iron and manganese have been found in abundance, and a quartz reef containing gold has also been unearthed.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 23.

Statistics.

Production of Anthracite Coal for week ended November 17th and year from January 1st:

Table with 4 columns: Year, Week, and two columns of production in tons of 2240 lbs. for 1888 and 1887. Includes entries for P. & Read, R.R. Co., Cent. R.R. of N. J., L. V. R.R. Co., D. & W. R.R. Co., D. & H. Canal Co., Penna. R.R., Penna. Coal Co., N. Y., L. E. & W., and Total.

Increase..... 3,712,791. The above table does not include the amount of coal consumed and sold at the mines, which is about six per cent of the whole production.

Production for corresponding period: 1883..... 28,773,476 1885..... 27,850,187 1884..... 27,815,367 1886..... 28,708,716

Production of Bituminous Coal for week ended November 17th, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

Tons of 2240 lbs.	1888.		1887.
	Week.	Year.	Year.
Phila. & Erie R.R.	2,478	58,383	17,390
Cumberland, Md.	76,438	3,186,719	2,872,481
Barclay, Pa.	10,000	140,559	100,954
Broad Top, Pa.	10,482	321,955	304,418
Alegany, Pa.	71,121	2,950,372	2,796,167
Pocahontas Flat Top	20,083	699,529	740,137
Kanawha, W. Va.	32,218	1,215,513	819,037
Total	248,335	9,965,217	8,961,089

*Week ending November 14th.

WESTERN SHIPMENTS.

Pittsburg, Pa.	14,735	644,495	497,785
Westmoreland, Pa.	36,465	1,366,177	1,252,910
Monongahela, Pa.	7,900	354,247	335,455
Total	59,100	2,364,919	2,086,150

Grand total..... 307,435 12,360,136 11,047,239

Production of Coke on line of Pennsylvania R.R. for week ending November 17th and year from January 1st, in tons of 2000 lbs.: Week, 100,291 tons; year, 3,555,585 tons; to corresponding date in 1887, 3,218,530 tons.

Anthracite.

The anthracite market continues to rule quiet with rather a downward tendency, and, in fact, individual shippers of coal have taken considerably lower prices. We also hear of some of the companies selling below circular rates, quite unnecessarily as we believe, for it is injudicious to weaken the market when it has taken so large a quantity of coal at full prices. The companies could very well afford to keep it firm and steady until the opening of next year. Prices which we have heard quoted are from 15 to 50 cents below circular rates, the weakness being chiefly in broken coal, less in egg and very little in stove coal. The production, as reported officially, still continues to be enormous. During the week ending 17th of November it amounted 909,648 tons, which was 104,331 tons above the corresponding period last year. The shipments of coal as reported in the weekly statements has now reached 33,906,189 tons, or 3,382,000 tons above the shipments to the corresponding date last year. These enormous shipments are attracting much attention in the trade, and unless stopped will very shortly bring about trouble in prices.

Buffalo is now practically closed; very little more coal will go out from there, and shipments to that port are stopped. The coal will, therefore, be turned in this direction, and we may expect a rapid accumulation at the tide-water shipping ports. Some of the companies have commenced curtailing production. The Delaware, Lackawanna & Western is said to be running about 70 per cent of its full capacity. Some of the others have curtailed rather more than this. Others again are keeping up their shipments to the utmost.

It is said that the Rondout is to be closed for shipments about the 9th of December and the D. & H. Company is anxious to get away all the coal that it has on hand there. It is even said that it is offering special inducements to attain this end. We treat editorially this week some features of the coal trade, which will repay careful consideration, for they lie at the foundation of success in this business in the near future. If prices are to be cut and stocks allowed to increase, we shall shortly see a demoralized market where there is absolutely no occasion for it in the present condition of the business. We continue the nominal quotations as heretofore, but they are being shaded quite liberally even in some high quarters.

We quote f.o.b. prices for free burning coal at New York shipping ports nominally as follows: Broken, \$3.95; Egg, \$4.30; Stove, \$4.65; Chestnut, \$4.65; Pea, \$2@32.25.

Mr. John H. Jones, Chief of Bureau of Anthracite Coal Statistics, has issued the following statement of anthracite coal tonnage for the month of October, 1888, compared with same period last year. This statement includes the entire production of anthracite coal, excepting that consumed by employes and for steam and heating purposes about the mines, but does not represent the entire anthracite coal tonnage actually transported by the respective railroad companies, adjustment being necessary in the compilation to avoid duplications, etc.

COMPANIES.	Oct., 1888.	Oct., 1887.	Difference.
Phila. & Reading RR.	910,354	782,082	Inc. 128,272
Lehigh Valley RR.	714,852	328,603	Inc. 386,250
Central RR. of N. J.	639,715	390,891	Inc. 248,824
Del., Lack. & West. RR.	774,094	699,040	Inc. 75,054
Del. & Hud. Canal Co.	439,932	392,347	Inc. 47,585
Pennsylvania RR.	442,282	350,379	Inc. 91,905
Pennsylvania Coal Co.	173,638	177,538	Dec. 3,900
N. Y., L. E. & W. RR.	92,690	64,421	Inc. 28,269
Total	4,187,527	3,185,299	Inc. 1,002,228

COMPANIES.	For year 1888.	For year 1887.	Difference.
Phila. & Reading RR.	5,862,031	6,148,339	Dec. 286,308
Lehigh Valley RR.	5,450,353	5,030,278	Inc. 420,075
Central RR. of N. J.	4,760,237	4,042,940	Inc. 717,297
Del., Lack. & West. RR.	5,799,909	4,777,566	Inc. 1,022,343
Del. & Hud. Canal Co.	3,729,268	3,185,943	Inc. 543,326
Pennsylvania RR.	3,916,358	3,098,402	Inc. 817,956
Pennsylvania Coal Co.	1,416,777	1,274,347	Inc. 142,429
N. Y., L. E. & W. RR.	788,210	628,935	Inc. 159,275
Total	31,723,143	28,186,749	Inc. 3,536,394

	Oct., 1888.	Oct., 1887.	Difference.
From Wyoming Region	2,234,306	2,124,051	Inc. 110,255
From Lehigh Region	873,591	36,986	Inc. 836,605
From Schuylkill Region	1,279,630	1,034,262	Inc. 245,368

	For year 1888.	For year 1887.	Difference.
From Wyoming Region	18,375,758	15,302,773	Inc. 3,072,984
From Lehigh Region	4,518,168	4,282,615	Inc. 235,553
From Schuylkill Region	8,829,217	8,601,361	Inc. 227,857

The stock of coal on hand at tide-water shipping points October 31st, 1888, was 359,133 tons; on September 30th, 1888, 370,811 tons; decrease, 11,678 tons.

Bituminous.

The bituminous trade is in better shape than the anthracite. The companies are all full of orders and are even behind in their deliveries, cars being scarce and much pressure in the demands for the coal. The recent heavy storms, which delayed nearly all the ocean steamers and greatly increased their consumption of coal, has created an urgent demand for coal in this harbor, more almost than the companies are able to supply. We hear the Pocahontas Company is unable to fill its orders and that the Chesapeake & Ohio recently sold it 15,000 tons of coal to help it out. Full prices are being received for bituminous coal, and are likely to be maintained while the present scarcity of cars remains and while the orders are as urgent for coal as they have been of late.

We continue our prices of bituminous coal as heretofore: \$2.60 f.o.b. Baltimore and Georgetown, and \$3.25 for New York Harbor shipping ports; \$3.50 alongside New York.

Boston. Nov. 22.

The market begins to show some signs of weakness, but it is in the individual coals chiefly that the break is noticeable. If the companies are shading prices they do so very quietly. However, there is plenty of coal to be had at lower prices than heretofore. The colder weather here has had a tendency to steady the market, but the situation still favors buyers on most sizes. Demurrage is not so troublesome as it has been, and deliveries are now fairly prompt.

The bituminous coal movement is active on old orders, but it is just the period when there is no new business to report. Those shippers who have been pressed to keep up deliveries are over the worst of it now, so they believe, and this is probably the fact. F.o.b. prices continue fairly steady at \$2.45@3.60, with but little coal at less than \$2.60. This makes delivered price of about \$4.15@4.25.

The freight situation changes very little. Rates have been a little easier in some quarters, but are about as high as ever. Those captains who took the risk of season contracts would appear to have the worst of it this year. Vessel owners are having their innings, and are seeing a good year.

We quote vessel rates, exclusive of discharging: New York, \$1@1.20; Philadelphia, \$1.50@1.60; Baltimore, \$1.55@1.60; Newport News and Norfolk, \$1.50@1.60; Richmond, \$1.75; Provincial, \$1.90@2.

The retail movement is fair and prices are maintained.

Delivered prices are: Stove and Nut, \$6.50; Egg, \$6.25; Broken, \$6; Franklin, all sizes, \$7.75; Lehigh Egg, \$6.50; Broken, \$6.25. Wharf prices 50 cents less than the above. Bituminous coal, \$4.25 on the wharf.

Buffalo. Nov. 22.

The demand for anthracite coal is now only of a local character or for some near-by points. No changes made in quotations. The supply of cars seems to be much better, so that orders sent to the mines for delivery to Western points from our dealers are more readily filled and less grumbling is heard.

Bituminous coal continues in light supply, but this difficulty will be obviated in a great measure before long, as the close of navigation will curtail consumption. Prices without quotable change.

At the annual meeting of the National Board of Trade, held in Chicago last week, to which your correspondent was a delegate, no matters connected with the coal trade were brought to its attention. The discussions and action taken on many subjects were interesting and may prove valuable.

Our Common Council are still fighting the electric light and coal gas companies. The combine's prices are deemed to high, the final result will be known next week.

The Lehigh Valley Railroad Company has filed an answer to the suit brought by Messrs. Cox & Bros. "The company denies nearly everything stated in the complaint," says a dealer interested, "but admits carrying bituminous coal for little more than half the price of anthracite, on the ground that it costs more to handle the latter."

These two items are of interest to shippers of coal to the West: 1st, the projected Canadian Sault Ste. Marie Canal contract for its construction at a cost of \$1,250,000 has been awarded; and 2d, the Detroit Tunnel Company was incorporated last week, with a capital of \$1,500,000, to build a tunnel under Detroit River.

The Poughkeepsie Bridge over the Hudson River will be ready for business February 1st, 1889, and important changes in the coal trade of the East may be expected in consequence.

The Erie, Champlain, Black River, Oswego and Cayuga & Seneca canals will be closed on Friday, November 30th, 1888, at midnight, unless sooner closed by ice.

The weather for the past few days was cold, with occasionally a storm; vessels going into winter quarters at all late ports, showing that navigation is nearly over for the season of 1888. Chartering, however, active for Chicago, good for Milwaukee and Duluth, with little done for other places.

The shipments by lake westward from Buffalo from November 15th to 22d, both days inclusive, were 88,710 net tons, namely, 49,560 to Chicago, 21,800 to Milwaukee, 10,200 to Duluth, 1000 to Sandusky, 750 to St. Ignace, 150 to Marine City, 3450 to Gladstone, and 1800 to Racine. The total shipments for the season thus far 2,498,580 net tons, including cargoes on vessels from Tonawanda not reported at our Custom House.

The ruling rates of freight on coal were \$1 to Chicago, 90c to Milwaukee, \$1.10 to Racine, 75c to Gladstone, Duluth, and Saginaw, also 40c to Sandusky.

Receipts of coal here by canal for second week in November, 6745 net tons; shipments, 239 net tons.

Pittsburg. Nov. 22.

[From our Special Correspondent.]

Coal.—The meeting announced in our last was held. The coal men in the Monongahela have decided to close their mines until they can obtain better prices. The rates at which coal is sold in the Western and Southern markets do not cover first cost. The length of the shut-down will be governed altogether by circumstances. This will, unfortunately, affect at least 6000 men.

Prices in the pools are:
PRICE OF COAL PER 100 BUSHELS = 7600 LBS.
First pool.....\$4.75 Fourth pool.....\$3.25
Second pool.....4.25 Railroad coal.....5.00
Third pool.....3.75

Connellsville Coke.—The demand continues to increase. The supply of cars has improved, while the shipments exceed all previous exports in the region. A large number of new ovens (1200) are contemplated, work having been commenced. Prices have an upward tendency; \$1.50 coke is not far off.

The new rates are: Blast-Furnace, \$1.25 per ton; to dealers, \$1.35; foundries, \$1.40; crushed, \$2.20.

Freight rates to Pittsburg, 70c per ton; to the Mahanov and Shenango valleys, \$1.35; East St. Louis, \$3.20; to Cleveland, \$2.80; to Chicago, \$2.75; to all other points the same proportions.

FREIGHTS.

The latest coal charters to Nov. 23d per ton of 2240 lbs. **From Philadelphia to:**—Bangor, 2.00; Boston, 1.60@1.70; Charleston, .90; Chelsea, 1.55@1.60; Com. Point, Mass., 1.60; East Cambridge, 1.65; Fall River, 1.15@1.25; Galveston, 2.90; Gardner, Me., 1.60; Georgetown, D. C., .85; Lynn, 1.75@1.85; New Bedford, 1.15@1.25; Newburyport, 1.75; New York, .90; Norfolk, .70; Portland, 1.50@1.60; Portsmouth, N. H., 1.60; Portsmouth, Va., .65; Providence, 1.15@1.25; Richmond, Va., .80; Rockport, 1.22; Saco, Me., 1.75; Salem, Mass., .90; Savannah, 1.00; Washington, .85; Weymouth, 1.15; Wilmington, N. C., .60.

From Baltimore to:—Bangor, Me., 1.60; Bath, 1.60; Boston, 1.65@1.70; Bridgeport, Conn., 1.35@1.40; Bristol, 1.25@1.30; Brooklyn, 1.15@1.20; Charleston, .90; Fall River, 1.55; Galveston, 3.00; Gardner, Me., 1.75; New Bedford, 1.45@1.50; Newburyport, 1.55; New Haven, 1.45@1.50; New London, 1.45@1.50; New York, 1.25; Portland, 1.65@1.70; Portsmouth, N. H., 1.75; Providence, 1.50; Quincy Point, 1.50; Richmond, Va., .80; Roxbury, 1.50; Salem, Mass., 1.65@1.70; Savannah, 1.15; Somerset, 1.35; Williamsburgh, N. Y., 1.25@1.35; Wilmington, 1.00@1.10.

From New York to:—Bath, 1.30@1.40; Beverly, 1.15@1.20; Boston, 1.10@1.15; Bridgeport, Conn., .80; Cambridge, Mass., 1.15; Cambridgeport, 1.15; Charleston, 1.15; Chelsea, 1.15; Com. Pt., Mass., 1.15; E. Cambridge, 1.15; Fall River, .75@.90; New Bedford, .80@.90; Newburyport, 1.25; New Haven, .60; Newport, .85@.90; New London, .85; Norwalk, Conn., .60@.65; Norwich, .90; Portland, 1.10; Portsmouth, N. H., 1.20; Providence, .75@.85; Salem, 1.20.

* And discharging, 3c. per bridge extra. † Alongside. ‡ And towing.

METAL MARKETS.

New York, Friday Evening, Nov. 23, 1888.
Prices of silver per ounce troy.

Nov	Sterling Exch'ge.	Lond 'n Pence.	N. Y. Cts.	Nov	Sterling Exch'ge.	Lond 'n Pence.	N. Y. Cts.
17	4.88	43	94	21	4.88	43 1/2	94 1/2
19	4.88	43 1/2	94 1/2	22	4.88	43 1/2	94 1/2
20	4.88	43 1/2	94 1/2	23	4.88	45	94

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 5 per cent. During the week the bank lost £1,098,257 bullion, but the proportion of its reserve to its liabilities was raised from 33.40 to 39.93 per cent against an advance from 47.72 to 48.23 per cent in the same week of last year, when its rate for discount was 4 per cent. Thursday the bank lost £50,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 2,000,000 francs gold and a gain of 2,900,000 francs silver.

Copper.—A decidedly better tone has been observed lately in regard to Lake copper, and the small quantities available (exclusive of that held by the French Syndicate) are being rapidly picked up. Quotations have in consequence gained in strength, and some transactions have taken place for prompt and November delivery at 17 1/2c. with very few lots offered.

The deliveries to consumers are known to have been very heavy lately, and from what can be gathered there are little or no stocks left at the Michigan mines, everything having been rushed forward so as to take advantage of lower freight rates by water. Naviga-

tion on the Lakes will be suspended in a few days and this means an additional freight of about $\frac{1}{2}$ c. per lb. For casting copper the demand remains very satisfactory and we have to quote for same $16\frac{1}{2}$ @ $16\frac{3}{4}$ c.

The European markets have also been very firm, the syndicate having lately raised their prices 6d. for furnace material and £2 10s. for best selected copper; but having given about a fortnight's notice of this advance, the trade had ample time to replenish their stocks and purchase for some weeks ahead at the old prices. By this action the syndicate managed to dispose of pretty large quantities, and a quieter market in the immediate future is looked for. Yellow metal makers are well supplied with orders and hold firmly for $7\frac{1}{2}$ d. It is understood that large orders are held in abeyance a shade below that figure. The present quotations are Best Selected, £82 10s.@£83; English Tough, £81@£82; Strong Sheets, £86@£88; G. M. B. spot, £78@£78 5s.; 3 months, £78 15s.@£79; Chili Bars spot, £78@£78 2s. 6d.; 3 months, £78 10s.@£78 12s. 6d.

Messrs. Henry E. Merton & Co. report under date of London, November 10th, 1888, as follows:

"The anticipated advance in the prices demanded by the French syndicate for refined copper and furnace material was realized on Monday last, and, acting under this stimulus, the week opened with a slightly improved tone for raw copper. The syndicate, however, soon found it desirable to come to the support of the market, and paid £79 in the course of the week for fair quantities of good merchantable brands with three months prompt, which position, with the exception of a relapse on Thursday evening to £78 17s. 6d., ruled at the price named throughout the week. Spot warrants, on the other hand, being left without syndicate support, have been a little more irregular, opening at £78 5s., touching £78 7s. 6d., and closing at £78 2s. 6d. Very little distinction is now drawn between G.O.Bs. and G.M.Bs., the bulk of the speculative trade being done in the latter medium, which in all probability will soon absorb and replace the former.

"A large business is said to have been done in refined copper during the closing days of last week, in anticipation of the advance of £2 10s. per ton which the syndicate announced on Monday last, consumers being induced to contract some distance ahead as they are to have the benefit of any fall in the official syndicate price. It is, however, quite conceivable that this condition would, under certain circumstances, prove illusory, and that purchasers might find themselves loaded with copper at prices much above the open market rates. A small business is said to have been done at the advanced rates now ruling, but notwithstanding this, tough cake is still offering at about £80, and best selected at £81 to £81 10s delivered terms.

"The trade in manufactured copper has been rather quiet during the week, but the prices remains officially at £88 for strong, whilst good orders are still being accepted down to £85. India still holds aloof, and has not yet decided to pay present rates. Orders for yellow metal are offering at $7\frac{1}{2}$ d., but makers are firm at $7\frac{3}{4}$ d. for sheets and $7\frac{1}{2}$ d. for sheathing.

"The syndicate prices for furnace material have also been raised by 6d. per unit, and now rule at 16s. 6d. for best R. T. precipitate, 16s. for Anaconda matte. A bid of 6d. less for the former has been refused.

Tin.—On the whole the market has been quiet, but there is now a decidedly firmer tone. There have been buyers for large quantities of "futures" at 22.50c, January, February, and March delivery, with no sellers under $22\frac{1}{2}$ @ $22\frac{3}{4}$ c., and only small quantities at that figure. Spot rules at $22\frac{1}{4}$ c. The London market has been quite uninfluenced by this, and quotations there are above our parity. We understand that scarcely any tin has lately been shipped from Europe to this country except for completion of previous contracts, and the heavy arrivals lately coming to hand will therefore be discontinued very soon. In the meantime, consumption, if not very brisk, is steady, and stocks may, therefore, be expected to decrease at a good rate. At the beginning of this week prices in London gave way to £100 15s., but have since recovered to £101 5s. spot, and £101 17s. 6d. to £102 three months.

Lead.—The past week has again witnessed great activity in the lead market, and taking the total sales in the Eastern and Western markets it is believed that upwards of 5000 tons have changed hands, and this large quantity has gone to bona fide consumers. The buying observed during the last few weeks has been quite astonishing, and clearly proves that consumers have been working without any stocks, and simply buying what they absolutely needed for immediate use. The white lead manufacturers have been especially conspicuous as buyers, and the smelting companies having come into the market with offers, a large business has resulted. These heavy purchases taking place at the approach of the dull season of the year, clearly proves that the trade has confidence in present quotations, and to all appearances it does not seem likely that prices will decline much further, as any slight drop would doubtless bring out more large buying orders. Quotations have ruled from 3.70@3.75, principally the latter figure. One or two sales have, however, been posted at lower figures, but these are understood by the trade to be simply settlement quotations.

In Europe consumption also continues on a satisfactory scale, and Spanish lead is quoted in London £13 5s., and English lead £13 10s.@£13 12s. 6d., whilst the inland smelters in France and Germany are realising higher prices in comparison.

Chicago, Ill.—Messrs. Everett & Post telegraph us to-day as follows: Market has been quiet, though a trifle weaker. Sales foot up 400 tons at 2.50,

Spelter has been neglected, and we have to reduce quotations slightly, Western spelter being now 5 to 5 $\frac{1}{2}$ c. The foreign market remains about steady at £18 5s. to £18 7s. 6d. for advances and £18 10s. to £18 12s. 6d. for specials.

Antimony continues strong, with very little to offer. We quote Hallett's 10 $\frac{1}{4}$ @ $\frac{1}{2}$; Cookson's, 13c.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Nov. 23.

Heavy Chemicals.—Although buyers are taking little more than actually necessary for immediate requirements, there is a firm tone to the market, occasioned to a large extent by the nature of Liverpool advices. Early in the week, the trade was slightly excited by a report from Liverpool, in which it was stated that a combination of manufacturers in all branches of the alkali trade, including caustic soda, chlorate of potash, soda ash and bleaching powder was contemplated. Such a combination, it was stated, was necessitated by the organization of the salt producers, and consequent increase in cost to alkali manufacturers. With some, this rumor gained so much credence that a contemporary hastened to assure its readers that there was little doubt of the project being successfully consummated. The tenor of later advices, however, as well as the opinions expressed by leading importers in this city, warrants the belief that there is considerable doubt of any such combination being formed at present, and whether it can be ultimately accomplished is still a matter upon which there is a wide diversity of opinion.

There is another fact in the situation which merits careful consideration, as we stated in previous reports. A Berlin correspondent of an English contemporary writes from that city as follows, concerning the German export soda trade: "The establishing of the salt syndicate in England, whereby the cost of production in the alkali industry must be considerably increased, has rendered the latest issue of the Customs returns unusually interesting, in so far as they relate to the export trade in soda. These show that the trade is steadily growing, and we may fairly expect a more rapid growth now that the English trade is hampered by the Salt Trust. The quantity of German soda exported in the first nine months of the current year amounted to 18,727 tons, against 13,704 tons in the corresponding period of 1887." In this connection, we can see the danger of German competition should an English combination be formed.

Writing from Liverpool on the 10th inst., Messrs. J. P. Brunner & Co. say: "There is little change to report in the position of chemicals, and although there is no special activity in the trade, everything is very firm, with the exception of caustic soda, which still keeps very flat. Soda ash, being in small compass, is held for full values. There have been several inquiries from America, although no actual business is reported. For the Mediterranean a number of transactions have taken place. Several makers are so fully booked that they are obliged to decline orders for November delivery. Caustic soda is still drooping, and although makers hold for full values, resellers are ready to make concessions in order to force sales. Bleaching powder is well maintained. Sales have been made for prompt delivery at £7 18s. 9d.@£8, the former prices for resale parcels. Chlorate of potash is offering at 5 $\frac{1}{2}$ @5 $\frac{3}{4}$ d. for prompt, and for all 1889 quotations range from 6@6 $\frac{1}{2}$ c. Bicarbonate of soda is in good demand, and prices are rather firmer at £4 12s. 6d.@£4 15s., according to brand and quantity. At the close it is rumored that the salt syndicate have fixed the price of salt at 9s. 6d. per ton net at Widnes, and chemical makers seem to feel that they are badly treated."

The local trade remains in about the same condition as noted in our last report, although in some quarters the reports from abroad have had a rather unsettling effect. It should also be remembered that stocks on the spot are light and quotations for supplies in that position are in some instances nominal, and, therefore, should any sudden action be taken by the English manufacturers, buyers might be unable to place their orders at the quotations given. There has been an improvement in the inquiry from the glass makers for carbonated soda ash, 48 per cent., and as stocks on the spot are very light, values are well sustained. Quotations on the spot are about 1.25@1.30c., and to arrive is held at about 1.25c. Caustic soda ash is unchanged, while caustic soda continues weak, there being little demand here, and the actual condition of the English market, aside from all wild rumors, being correspondingly flat. The quotations for the higher tests, 70, 74 and 78 per cent., are all in the neighborhood of 2.35c., while 60 per cent may be had at about 2.50@2.55c. Sal soda has slightly advanced in sympathy with higher Liverpool prices. Spot supplies are held at about 1c., with to arrive quoted at .95c. Bleaching powder is rather unsteady. There is a larger supply on the spot than last week and prices are consequently rather weak at about 2.10@2.15c., and it is reported that a number of contracts for future delivery at periods ranging from the current month to any time in 1889 have been placed at about 2c. If this is true, it would appear that there is little confidence in the English "combination."

Acids.—A very fair business is being done, and although prices are not at very grand figures, manufacturers as a rule seem very well satisfied.

Acetic acid is still neglected by buyers, and in the face of active competition to get whatever business there is, it is difficult to get more than nominal quotations. These, however, may be given at 2@2 $\frac{1}{2}$ c. for

immediate delivery, with contracts to be had at considerably less than 2c.

Nitric acid is moving very fairly, and prices are firmly maintained. As yet no further advance has been made, but with the price of nitrate of soda rapidly increasing, and with a prospect of it becoming scarce, it is to be expected that nitric acid manufacturers will increase their rates accordingly.

Muriatic acid remains as quoted last week, with little more than usual consumptive demand.

Tartaric acid is not wanted to any great extent, and dealers report the market featureless. The quotations are unchanged.

Oxalic acid is sold only in a small way. The demand continues steady, however. The quotations remain at 9c. per pound by the single cask and 8 $\frac{1}{2}$ c. per pound for ton lots of prime German and English, ex store or dock at New York, Philadelphia or Boston.

Sulphuric acid is still held very firmly. Manufacturers uniformly report light stocks and an improved demand. Very little seems to be obtainable for immediate delivery. The quotations for 66 degrees range from .95 to 1.25c., according to quantity and date of delivery; 60 degrees remain at .90@.95c.

Fertilizers, etc.—This trade continues in excellent condition. The improved inquiry now existing for nearly all descriptions has been maintained for some time past, and dealers are therefore very much indisposed to complain. The revised price-list is about as follows: Azotme, \$2.55@2.60 as to quality; dried blood (city), low grade, \$2.50@2.55 per unit; Western high grade, \$2.60@2.65 per unit for ground material; tankage, high grade, \$24@25 per ton; low grade, \$22@23 per ton, as to quality. Fish scrap, \$25 per ton f.o.b. factory. Sulphate of ammonia, \$3.40 per cwt.

Refuse bone-black, guaranteed 70 per cent phosphate, is quoted at \$19.00@19.50 per ton. Dissolved bone-black is 97 $\frac{1}{2}$ c.@\$1 per unit for available phosphoric acid, and acid phosphate 75@80c. per unit for available phosphoric acid.

Steamed bones, unground, \$19; ground, \$25@26.

Charleston rock, undried, \$5 per ton; kilm dried, \$6 per ton, both f.o.b. vessels at the mines. Charleston rock, ground, is held at \$10@10.50 ex steamer at New York.

Our Charleston correspondent reports the shipments of phosphate rock from that port during October as follows:

	Crude.	Ground.
To domestic ports.....	19,453	172
foreign ".....	400
Total, tons.....	19,853	172

During the corresponding period in 1887 the total shipments of crude were 14,555 tons, and of ground 1084 tons.

Muriate of Potash.—This week H. H. Salmon & Co. received the largest cargo ever brought to this port, namely 1600 tons, or 16,000 bags, on the "Treasurer." The "Straits of Gibraltar" also brought to the same firm, at Charleston, S. C., the second largest, 15,000 bags.

Messrs. Salmon & Co. inform us, however, that these arrivals have gone immediately into consumption, and there is still an unsupplied demand existing. The prices for round lots of 50 tons are quoted at \$1.80 per cwt., basis of 80 per cent, by sail shipment, and \$1.82 $\frac{1}{2}$ by steamer.

Double manure salts are not altered in position since our last report. The supply is limited, owing to high and scarce freights. Quotations remain at 1.15@1.20c., on a basis of 48 per cent potash. Sulphate of potash is quiet and unchanged at \$2.30 per cwt., basis of 90 per cent.

Kainit.—Nothing is to be had on the spot, and quotations are entirely nominal. There is very little offering for shipment.

Brimstone is quiet, prices remaining at \$22@23 for best seconds on the spot, and \$20.50 to arrive.

Nitrate of soda continues very firm at slightly advanced prices, which now are 2.30c. on the spot, and 2.27 $\frac{1}{2}$ @2.30c.

G. B. Nichols estimates the visible supply on the 15th inst. at 273,705 bags, including 62,205 bags in store in New York, 10,000 bags in Philadelphia and Boston, and 201,500 bags to arrive. Of the latter amount 117,000 bags will arrive in this city. Of the trade Mr. Nichols says: "The European markets have advanced steadily under an apprehension that the visible supply is inadequate. It is not at all unlikely that some of our stock will be sent for. During the fortnight ending November 15th, 30,000 bags were sold at 2.18@2.25, including February shipment. The spot price in New York is advanced to 2.30, and some favorable position for future is held at the same. The shipments from the coast to November 1st were 450,000 tons to Europe and 58,000 tons to United States, against 420,000 and 64,000 respectively last year."

There seems to be considerable ground for the belief that Europe will take a large amount of the supply intended for this port. We are informed that one full cargo has already gone that way at a price equivalent to 2.32 $\frac{1}{2}$ c. here, and there are not wanting those who predict that 2.50c. will be ultimately reached.

Minerals.—Sulphate of barytes is moving in a fair way at unchanged prices. Prices in detail are as follows: Special brands of imported, \$21.50; best No. 1, \$17.50@18.50; best off colored grades, \$15; No. 2, \$14.

Chalk is being offered a little more freely. Quotations for immediate shipments are reported in the neighborhood of \$3.85, while later shipments may be had at much lower figures.

China Clay.—Nothing more than a fair jobbing demand is reported, and the market is otherwise without features of interest.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, Nov. 23.

A sale of real estate was made this week which is not only of interest as an illustration of the great rise in land values on Manhattan Island during the past fifty years but will, it is hoped, have a beneficial effect upon the local market for building materials, even if it be merely "a drop in the bucket." The estate of Joshua Jones, comprising twelve acres, was bought in 1808, eighty years ago, for \$3120, and was used as timber land; to-day it stands in the high class residential portion of the city, and at the sale this week brought \$1,840,000. The property included one hundred vacant lots of full city size, and the distribution of so large an estate, which has been tied up in the hands of executors, will, it is hoped, encourage building not only on the property itself but upon that adjoining, so that the year now at hand may be one of activity and, consequently, profit to those who deal in building materials.

Bricks.—The market for common hards shows little variation from the conditions which have characterized it for some weeks past and which have been duly chronicled in our report. The outlet for supplies coming forward continues open to a surprising extent; the medium grades, or those costing below \$6 per M. are all sold up and sales to arrive have also been made. There is little inquiry for the best grades, and prices remain as quoted in previous reports. Pales are neglected.

Lime.—There have been five or six arrivals from the East during the week, but, so far as we have been able to ascertain, most of it has been taken at the usual association rates. There is some coming forward, but the uncertainties of navigation at this season prevent any calculation as to the date of its arrival. On the whole, however, there seems to be a sufficient supply to satisfy all inquiries for the present.

Roofing Slates are moving very fairly. There has been no improvement in the demand for the Vermont article, while Pennsylvania black roofing continues very scarce.

Building Stones.—There is little doing in this line of the trade; nothing more than a slow demand is apparent. It is probable that the cold weather will prevent further work in the quarries in many locations. For prices of building materials and wages paid to laborers in New York and vicinity, see our register of current prices on another page.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 23.

While there is no very marked change in the iron market here, or indeed in any other part of the country, there is unquestionably some disappointment felt that the expected improvement has not come since the election. On the contrary, whatever change has occurred has been toward a weakening of the iron market and a tendency toward lower prices. There is nothing in the statistics which portends any unfavorable course in the market; on the contrary, in Bessemer ores the market is decidedly strong, and for the past two months has been so. All of that quality of ore coming from the Lake Superior mines has been contracted for, and even non-Bessemer Lake ores have for some time been in good demand at almost "fancy" prices. Connellsville coke has been increased 25 cents a ton in price and is likely to advance still further. There appears, therefore, some ground for higher prices. Nevertheless the transactions do not show the improvement that these facts and the season naturally lead us to anticipate.

American Pig.—The demand in this market continues light and prices unchanged at \$18@19 for Standard No. 1, \$17@18 for No. 2, and \$16@17 for forge. Some Southern iron is to be had and some has been sold, though there appears to be a disinclination on the part of makers to contract for next year's delivery, not because the present prices at the furnace are unsatisfactory, but because railroad freights are uncertain, the roads being unwilling to contract at present rates.

Scotch Pig.—Very little is doing in this article. Arrivals go directly into consumption, but there is no inducement for bringing it here and, consequently there is no spirit in the trade. We still continue to quote Coltness at \$21 to \$22, Langloan at \$21 and Dalmellington at \$20 to \$20½.

Steel Rails.—These continue somewhat unsettled in price. The chief business done during the week has been the placing of orders for about 45,000 tons by the Pennsylvania R. R. Contracts were taken by three mills on its lines for 15,000 tons each, and were, it is said, at \$28 per ton. As one of the Pittsburg mills recently sold at \$26, and another has been offering at \$26.75 to \$27, this price naturally appears very high. There may have been some special reason for paying it which is not apparent to the trade. We hear of an order for 5000 tons taken, it is said, by Parke Brothers, of Pittsburg, at \$27, the rails going to Fort Worth. An order for 3500 tons for the Pacific coast was taken by a mill delivering in Chicago it is supposed at pretty low figures. The delivery of steel rails this year up to the first of November are reported by the Board of Control of the steel mills at 1,029,179 tons, and the sales of this year aggregate 1,250,740 tons; sales for 1889 delivery are reported at 116,180 tons. Some additional sales have been made since the first of the month, which will bring this amount up to, perhaps, 250,000 tons for next year's delivery. This is a small amount, and has been taken chiefly by the smaller mills.

The favorable opinion that certainly prevails here

in some financial circles concerning railroad building in 1889 is not shared in by some of our steel mills. The president of an Eastern mill expresses to us the opinion that the hostile legislation in several of the States will greatly lessen the investment of money in building new roads, and he does not anticipate a very large demand for steel rails next year.

One of the high officers of a Western mill writes us: "The outlook for the steel trade is anything but encouraging, we have had a very dull year and a particularly dull fall trade. The outlook for 1889 is not at all hopeful, still I trust that our recent great political victory will have the effect of restoring confidence and induce further investments of the vast amount of idle capital there seems to be existing."

These views from those so well able to form a correct opinion must certainly have great weight. No doubt opinions of this kind among the mill directors account for the very low prices, \$26 and \$26.50, at which some rail contracts were recently taken.

Old Rails.—Old rails are relatively much higher than new. T's are quoted at \$23 to \$23½, and double heads \$25 offered and \$26 asked. Cables to-day report the English price 78 shillings, which would be above our figures here.

Structural Iron.—We hear of a contract for several thousand tons for the Brooklyn Elevated Railway, but aside from this there is little worth noticing. New orders are scarce, and several of the mills are commencing to complain of the small amount of work that is being offered. Nevertheless we are still of the opinion that the opening of next year will see a good deal of new work put through, and even before the close of the present year a good many orders will be in the market.

Scrap Iron.—Scrap still continues in good demand, with \$21 for yard scrap as a fair quotation. We learn of several lots having been sold, but the prices are not reported; nevertheless, the demand is better for this as well as for old rails than it appears to be for the new material.

For other quotations, we refer to our usual table of current prices on another page.

Louisville, Nov. 20.

[Special report by Messrs. HALL BROTHERS & Co.]

The market is a little more active, so far as sales are concerned, and the prices are about as last quoted. There have been a number of deals closed for round quantities during the last few days. The furnaces as a rule want a shade better price for deliveries extending through next year, but buyers display an unwillingness to pay any premium for extended shipments. The aggregate of the business for the week is large and satisfactory, with good prospects for a larger amount of orders in the next few days. Quotations for cash f.o.b. cars at Louisville will be found in our weekly register of prices.

Philadelphia, Nov. 23.

[From our Special Correspondent.]

Not a single new feature has developed itself in the crude iron market. Makers and buyers are doing nothing with reference to new business. Prices are very strong for all kinds, from special brands down to inferior. The strongest companies decline to make any concessions even for large lots. The basis of the confidence is that a large amount of business will shortly come in. There are no signs of an accumulation of stocks. Under some circumstances present conditions would stimulate demand. The few large consumers who have made heavy purchases for delivery next year are unwilling to extend their stocks any farther. A few customers have been asking for quotations on Southern iron. There is no inducement as yet to buy in that quarter.

All kinds of blooms and billets are held at full prices. Anthracite is selling well in small lots for immediate delivery. A few long running contracts for blooms will shortly expire. It is the intention of buyers not to renew but to purchase for the present as they need. Muck bars are a little weaker, which is due partly to the failure of the large consumers to renew contracts which have expired at the advance asked. On small lots prices are as high as they were a month ago and possibly on large lots also, but makers are not quite so confident of obtaining outside prices from their large customers. Some few buyers of bar iron have been favored with slight concessions on medium iron within the past few days but on refined iron in small lots full prices have been paid.

If confidence goes for anything there is not quite as much this week, though there is no reason for believing that there will be any falling off in demand between now and the holidays. All makers and mill men are doing a fair amount of business, but there is not quite as much anxiety to secure future supplies as was noticed a little earlier in the season. Buyers feel convinced that prices will be irregular throughout the winter. The occasional concessions which have been heard of this week have had a rather unsettling effect.

Nail makers report no change in prices and are selling in a small way, the better brands having apparently the preference. This, however, indicates that the poorer nails will be crowded out. The rush for sheet iron is over and the mills are busy on large contracts taken earlier in the season.

Merchant steel is not moving in quite as large lots, though quotations are without change. Two or three buyers have been making inquiries and are anticipating a little shading upon sheet steel and crucible machinery. Some large contracts have been placed for plate and tank iron in some mills in this city at a cut of one tenth, though Western quotations on small lots show no decline. The ship yards hereabouts have contracts for steel material for at least 12,000 tons. An order for 2000 tons was placed in Pittsburg on Monday. The bridge builders will not cover their

requirements at this time and are living in anticipation of a little reduction in angles and tees. No large contracts have been placed, but there is a great deal of business talked about. Skelp iron is weakening a little; 1'85c. is now offered, but 1'90c. to 1'95c. is the ruling rate.

Steel rails are likely to advance. The Pennsylvania Company ordered 45,000 tons this week, which was the event of the week. A great many railroad managers who have been talking about buying stock to close off large lots at \$27 and less, and the apparent fixing of the bottom price at \$28, has taken them by surprise just at present. It is not known what course is likely to be pursued. Old rails are very scarce, and demand is still in excess of the supply, but buyers are purchasing very little on account of the difference of about one dollar between them and sellers. The handlers of scrap are unable to deliver all scrap called for, and have bids now in hand for selected and No. 1 scrap which they are unable to fill.

Pittsburg, Nov. 22.

[From our Special Correspondent.]

Raw Iron.—There has been a fair demand for most descriptions of iron. Furnacemen and dealers generally have no reason for complaint, and most of them say the week's business has been satisfactory. While some parties are anxious for a boom, others say there is no hurry. The market is becoming more assured. Most of the mills are still employed on iron purchased in September and October. Before that is worked up they will require fresh supplies. Furnaces are running to their full capacity at many points. Furnacemen have advanced wages as they promised in case of the election being decided in favor of protection. This is as it should be, and the workmen of course are well pleased. The advance in coke has been maintained with an increased demand—a further advance not far off. The coke shipments in the Connellsville regions for October was the largest ever made. The Western shipments since June show an increase of 8490 cars; Pittsburg increase being 4000 cars for same time.

Forge Pig in fair demand, more especially well known or favorite brands. There is increased inquiry for next year's delivery. A valley furnaceman in the city on business was asked to fix the price on several round lots for January and February delivery. Consumption is going on steadily and it requires a large amount of raw iron to keep the mills in operation. The market will be watched with a good deal of interest, some dealers being of the opinion that the next three weeks will enable the trade to form a pretty correct idea of what will be the prospect for next year's business. Muck bar remains firm with a good inquiry for present and future delivery. Old iron rails are firm, with moderate sales, and some lots held for higher prices. Scrap material steady, a good many lots changing hands.

Coal and Coke Smelted Lake Ore.

1800 Tons Bessemer.....	17.50 cash
1000 Tons Gray Forge Extra.....	16.50 cash.
1000 Tons Gray Forge.....	16.25 cash.
1000 Tons Bessemer, December.....	17.25 cash.
1000 Tons Gray Forge.....	16.00 cash.
1000 Tons Gray Forge.....	16.20 cash.
1000 Tons Gray Forge.....	16.50 4 mo.
750 Tons Gray Forge.....	16.20 cash.
150 Tons No. 1 Foundry.....	18.00 4 mo.
100 Tons No. 2 Foundry.....	17.00 4 mo.
100 Tons No. 2 Foundry.....	17.00 cash.

Coke, Native Ore.

550 Tons Gray Forge.....	16.00 cash.
500 Tons Gray Forge.....	16.00 cash.
200 Tons Gray Forge.....	16.00 cash.
175 Tons No. 2 Foundry.....	16.75 cash.
50 Tons No. 2 Foundry.....	17.00 cash.
50 Tons Silvery, Extra.....	19.00 cash.
50 Tons No. 1 Foundry.....	18.25 4 mo.

Slabs and Billets.

1000 Tons Billets.....	29.50 cash.
500 Tons Nail Slabs.....	29.00 cash.
500 Tons two-inch Billets.....	33.00 cash.

Muck Bar.

2000 Tons January and February.....	30.00 cash.
3000 Tons.....	30.25 cash.
1000 Tons December.....	29.75 cash.
1000 Tons December.....	29.50 cash.
400 Tons Spot.....	29.00 cash.

Old Iron and Steel Rails.

2000 Tons American T's.....	24.55 cash.
1000 Tons American T's.....	25.00 cash.

Ferro-Manganese.

150 Tons 80 per cent.....	54.50 cash.
100 Tons 80 per cent.....	55.00 cash.

Steel Wire Rods.

500 Tons American fines.....	42.00 cash.
500 Tons American fines.....	41.00 cash.

Steel Bloom Ends.

1000 Tons Bloom Ends.....	18.50 cash.
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Scrap Material.

200 Tons No. 1 Wrought Scrap, Extra, net.....	22.50 cash.
200 Tons No. 1 Wrought Scrap, net.....	21.00 cash.
200 Tons No. 2 Wrought Scrap, net.....	19.50 cash.
200 Tons Cast Scrap, gross.....	17.00 cash.

FINANCIAL.

NEW YORK, Friday Evening, Nov. 23.

The business of the mining share market continues to be small, with little variation in the prices of the different stocks.

Sylvanite was quiet and firm at from \$3.10@3.15, some 700 shares changing hands. This is, we understand, a property of considerable merit, though we have not yet seen expert reports that would justify the "great expectations" which apparently are entertained by those who are selling the stock at \$3.15 a share (\$1,575,000 for the property), and who talk of \$10 or \$15 a share. The ores are high grade, and, as is usual, somewhat irregularly distributed.

The developments are not very extensive, and further expert information should be furnished to show how the property has increased sevenfold in value since it was bonded.

Iron Silver was steady at \$3.40. Plutus active with a declining tendency, going from 97 to 85c. Breece at 31c. Dunkin at 95c. Leadville at 11c. Little Chief at 22c. Silver Cord at 80c. Monitor at 10 and 11c.

Since the meeting of the dissatisfied stockholders, to which we referred in our issue of September 22d, the Messrs. Valentine and others have restored over \$15,000 to the treasury of the Hector Gold Mining Company, and consequently leaving the company in debt to the extent of \$340, and they have furthermore agreed to reduce the salary roll to less than \$200 per month. It is hoped that an amicable settlement may be arranged so as to protect the stockholders' just rights without levying any assessment at all.

Plymouth Consolidated has advanced from \$8.75 to \$9.25, selling to-day at from \$9 to \$9.10.

Brunswick shows but a few sales at 8@9c. Quicksilver Preferred was quiet at from \$36 to \$36.50. Common declined from \$7.75 to \$6, and later advanced again to \$7.

Bodie Consolidated shows one sale at \$1.80, Standard one at \$1.55.

The "Amadors" are selling at the prices quoted for the last few weeks.

Silver King was dealt in to the extent of 6750 shares, with a downward movement in the price of the stock, which went from \$1.15 to 80c., selling to day at from 83c. to \$1.

Colchis continues to be active, selling at from \$2.05 to \$2.15. Silver Mining of Lake Valley was neglected at from 28 to 30c.

Kingston & Pembroke sold all week at \$1.

United Copper opened at 60c., and later advanced to 65c., but towards the close of the week declined to 50c.

A little more activity was shown in El Cristo in the beginning of the week, when it was dealt in from 70 to 63c.

The Ontario Silver Mining Company has announced its one hundred and fiftieth dividend of fifty cents per share, making a total paid to date of \$9,650,000. The stock holds its own at from \$33.25 to \$33.50.

The Daly Mining Company, a neighbor of the Ontario, has declared its usual monthly dividend of twenty-five cents per share, a total to date of \$825,000. This stock is but rarely dealt in in New York.

Very little work will be done at the mines of the Rappahannock Gold Mining Company this winter, only two or three men being employed, but we are informed by the president of the company that next spring new machinery will be put in place and various other improvements made. The boom that was long ago predicted for this stock has "petered out," and but few sales are now made. The price this week went down to 6c., but later advanced to 10c.

Caledonia was quoted at \$3.20, with little doing at that price. Iron Hill sold at 11c. and Homestake at from \$12 to \$12.25.

Buffalo Iron Mining was again one of the most active stocks on the list, and was firm at from \$6 to \$6.38, some 3900 shares changing hands.

Latest reports from the Dickens-Custer mine of Idaho speak favorably of the prospects of the company. There is said to be an abundant supply of ore now developed and the grade is highly satisfactory. The company's officers in London would do well to be less chary of information to shareholders, and thus avoid the distrust which is always engendered by concealment.

Holyoke shows one sale at 6c. The superintendent of the Consolidated Esmeralda

mines of Nevada deserves credit for the regular and elaborate reports for the working of the property forwarded to London for publication. That solitary streak of rich ore in the Durand is made to do noble service. It forms the text for many elaborate dissertations on the value of the property, and the assays are used as soothing syrup for the shareholders. Much stress is laid upon the extent of ground owned by the company, but when it comes down to a question of results the "Durand" vein, from which can be mined a small quantity of high-grade ore, is held up to do duty for the mines. The bulk of the ground owned by the company was worked years ago by the Real del Monte Company, of London, and abandoned by them as worked out. The balance consists of locations barely prospected and an ancient mill. The whole was owned by Governor Blaisdell, and was sold for a very modest figure to the promoters of the Esmeralda Company. There is nothing in the property to justify its present large capitalization, \$400,000.

Comstocks, notwithstanding the rumors of a deal in the near future, remain inactive at the slightly lower figures. Consolidated California & Virginia sold at from \$10.63 to \$9.75.

Tuscaroras are slightly improved. Economical milling facilities at the mines will shortly be available and then the large quantities of low-grade ore can be treated at a profit.

Barcelona went from 72 to 65c. yesterday, but to-day sold again at 73c.

Sutro Tunnel stock was quiet, with a few sales at 10c. The Trust Certificates declined from 69 to 36c.

Advices from the Mulatos mine state that Ricardo

IMPORTS AND EXPORTS OF METALS AT NEW YORK NOVEMBER 14 TO NOVEMBER 20, AND FROM JANUARY 1.

Table with multiple columns listing metal types (Spelter, Zinc, Pig Lead, Antimony, Copper, Nickel, Tin, Steel Sheets, etc.), quantities, and prices for various companies and dates.

CURRENT PRICES.

Table of current prices for various commodities including chemicals, acids, alkalis, and building materials.

Table of current prices for building materials such as bricks, tiles, and various stones.

Table of current prices for various metals including iron, steel, and other alloys.

Table of current prices for rare metals such as aluminum, copper, and zinc.

Table of current prices for iron and steel products, including various grades and types.

Table of current prices for pig iron and other iron products.

Table of current prices for steel products, including beams, plates, and rails.

Table of current prices for structural iron and steel components.

Table of current prices for boiler tubes and other industrial machinery.

Table of current prices for cast-iron pipes and wrought-iron pipes.

Table of current prices for hot blast irons and other iron products.

Table of current prices for coke and bituminous pig iron.

Table of current prices for various iron and steel products, including rails and beams.

Table of Philadelphia prices for various commodities and goods.

Table of Baltimore prices for various commodities and goods.

Table of Birmingham prices for various commodities and goods.

Table of Pittsburgh prices for various commodities and goods.

Table of foreign quotations for various commodities and goods.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and amount of last dividend. It lists numerous mining companies and their financial details.

G. Gold, S. Silver, L. Lead, C. Copper. *Non-assessable. †This company, as the Western, up to Dec. 10th, 1881, paid \$1,400,000. ‡Non-assessable for three years. §The Deadwood previously paid \$275,000 in eleven dividends, and the Terra \$75,000. ¶Previous to the consolidation in Aug., 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia, \$24,300,000. **Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1886, the Copper Queen had paid \$1,350,000 in dividends. ††1,300,000.

NEW YORK MINING STOCKS QUOTATIONS.

Table with columns for 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND-PAYING MINES'. Each section lists company names and their stock prices for various dates from Nov. 17 to Nov. 23, along with sales figures.

†Ask. ‡Bid. †At the New York Stock Ex. Unlisted Securities ‡Assessment unpaid. Dividend shares sold, 21,145. Non-dividend shares sold, 62,236. Total New York, 83,381

BOSTON MINING STOCK QUOTATIONS.

Table listing mining stock quotations for Boston. Columns include company names, dates from Nov. 16 to Nov. 22, and sales figures.

Boston: Dividend shares sold, 13,083. Non-dividend shares sold, 15,410. Total Boston, 28,493.

COAL STOCKS.

Table of coal stock quotations. Columns include company names, par value of shares, and prices for dates from Nov. 17 to Nov. 23, plus sales figures.

*Bid. †Asked. **Of the sales of this stock, 48,734 were in Philadelphia, and 245,570 in New York. Total sales, 433,714.

San Francisco Mining Stock Quotations.

Table of San Francisco mining stock quotations. Columns include company names and closing quotations for dates from Nov. 16 to Nov. 22.

Johnson is about to sue the Aquayas for trespass in extracting ore from ground belonging to him.

Whilst the mine is no doubt a good one and will pay handsome profits to work, the conflicting titles render it dangerous for a foreign company to purchase it as contemplated. Could some arrangement be made in which the conflicting interests of Johnson and Auchita were silenced, there would be no difficulty in effecting a sale in London.

We have received a letter from Mr. Chas. E. Herbert, mining engineer, who states that he holds a contract from Ricardo Johnson for one-third of the property. We know nothing of the rights in the case, but this may possibly add another to the lawsuit one would acquire in purchasing the property.

The San Francisco News Letter more than hints that Smith and De Crano are in negotiation to assist Lloyd in the disposal of the property under his bond. There is nothing in this. They simply acted in a professional capacity as engineers, making an examination under instructions from clients in London.

Electric Stock Quotations.

The following are the latest quotations, prepared for the ENGINEERING AND MINING JOURNAL by Messrs. Crossman & Quick, brokers, New York city, under date of the 22d inst.: Edison, \$120@125; Edison Illuminating, \$83@86; Consolidated, \$50; Westinghouse, \$28@29; Brush, \$35@40; Brush Illuminating, \$30@31; United States, \$20@23; U. S. Illuminating, \$45@55; Daft, \$40@60.

Auction Sale of Stocks.

Specially Reported for THE ENGINEERING AND MINING JOURNAL. At the Real Estate Exchange, on the 21st inst., the following securities, hypothecated, were sold at auction by order of A. R. McCandless, Assignee: 2000 shares Breece Mining Company, 25 per share; 600 shares Decatur Mining Company, \$4 for lot; 100 shares Standard Mining Company, \$1.50 per share; 2000 shares American Antimony Company, \$15 per lot; 10,000 shares Georgetown-Eureka Mining Company, \$10 for lot; 8000 shares Woodside Mining Company, \$5 for lot; 1350 shares Silver Cliff Mining Company, not hypothecated, \$58 for lot; 100 shares Standard Oil Trust brought \$175 per share.

Dividends.

The following have been declared: Candelaria Consolidated Mexican Mining Company, of San Dumas, Durango, Mexico, fifty cents per share, or \$60,000, payable immediately at No. 221 Market street, San Francisco, Cal. Daly Mining Company, of Utah, dividend No. 21, twenty-five cents per share, or \$37,500, payable November 30th, by Lounsbury & Co., 15 Broad street, New York City. Ontario Silver Mining Company, of Utah, dividend No. 150, of fifty cents per share, or \$75,000, payable November 30th, by Lounsbury & Co., 15 Broad street, New York City.

Assessments.

Table with columns: COMPANY, No., When levied, Day of Sale, Amt per share. Lists various mining companies and their assessment details.

* Delinquent day and day of sale postponed to dates given above.

Meetings.

New Central Coal Company of Maryland, Room 54, No. 1 Broadway, New York city, December 11th, from twelve o'clock noon to two o'clock P.M.

Pittsburg & Lake Superior Iron Company, corner 25th and Liberty streets, Pittsburg, Pa. December 3d, at two o'clock P.M. Special meeting to consider a proposition to mortgage certain lands in Delta and Marquette Counties, Michigan, and to borrow money to pay for certain furnace interests.

Pipe Line Certificates.

Messrs. Watson & Gibson, brokers, report for the week as follows: The petroleum market is strong and dull and resists the depression in the stock market better than might be expected. There will be a reduction of three quarters of a million barrels of stocks this month notwithstanding the shut-down movement is no longer in force.

NEW YORK STOCK EXCHANGE. Opening, Highest, Lowest, Closing, Sales. Includes data for Nov. 17-23 and Total sales in barrels.

Boston Mining Stocks.

[From our Special Correspondent.] There has been a fair amount of activity in copper stocks the past week, and prices have been generally well maintained. Calumet & Hecla advanced on one day to \$317, a rise of \$3, and later sales were only at a decline of \$1, making a net gain of \$2 for the week. Quincy advanced from \$85 to \$87, selling later at \$86.

Boston & Montana continues to be the feature of the market, and sold up to \$75, at which price a good deal of stock was met, and later sales were at a decline of \$2. About 2500 shares were sold. Franklin has been dull but steady at \$18, and Atlantic firm at \$19.

Very little doing in Osceola, but holders are firm at about \$22@23. Tamarack sold at \$179, but declined on free offerings to \$175.

Kearsarge has been more active this week, the latest reports from the mine being considered more favorable. The stock opened at \$12 1/2, advanced to \$14, and finally declined to \$13 1/2. Over 1500 shares were marketed.

Butte & Boston sold at \$29 1/2, but later lost \$1, and closed at \$28 1/2.

There has been a good degree of activity in Allouez on the decline to \$4 1/2, and all the stock offered at about that price has been readily taken, and we look for much higher quotations for this stock in the near future. National has been stronger this week, selling up to \$8 1/2, and losing only 1/2 in the later dealings. Huron steady at \$7, with very little doing in it.

Pewabic has ruled very strong, and advanced from \$5 1/2 to \$6 1/2. There is evidently a desire on the part of the rival companies for the control of this stock, and it is quite probable that much higher prices will result.

Ridge advanced to \$2 1/2. This is one of the stocks selling below its real value, and we look to see a sharp advance in it before many days.

Bonanza has ruled dull and heavy, and declined to \$1 1/2. The promised advance in this stock seems to be as far off as ever.

In the silver stocks, Dunkin is firm at 95@97c. The treasurer has recently received a remittance of \$5,000 from the mine and another dividend is confidently expected in January. Napa Quicksilver is looking well and sold up to \$2 1/2. Catalpa sold at 17c.

LATER PRICES.

(By Telegraph.)—November 23d, 1 P.M.—Calumet & Hecla, \$310; Boston & Montana, \$73 1/2; Tamarack, \$175; Allouez, \$4 1/2; National, \$8 1/2; Franklin, \$17 1/2; Butte & Boston, \$27; Pewabic, \$5 1/2; Kearsarge, \$12 1/2.

St. Louis Mining Stocks.

A new mining exchange has been organized at St. Louis, which is expected to help out the trading in mining shares in that city. The regulations and by-laws of the exchange were copied from those governing the San Francisco and New York Exchanges, with few alterations. There are 50 active and 50 associate members, the former to pay \$25 initiation and \$3 a month dues, and the latter to pay \$25 initiation and \$12 a year dues, and to be charged but one half the fixed rate of commissions. Each active member is also entitled to one representative at \$10 a year. The rates of commission are 1/2% a share on stock selling at 15c and below, 1 1/2% on stock at 16 1/2c to 75c, 2c on stock at 77 1/2c to \$1.25, 5c on stock at \$2.52 1/2 to \$5, 10c on stock at \$5.02 1/2 to \$10, 15c on stock at \$10 to \$20, and 25c on stock selling \$20 and above. The sessions are to be from 11 A.M. to 1 P.M. and 2:30 P.M. to 4 P.M., with a call at 11:30 A.M., and no member will be allowed to trade with another on the outside or in another business exchange. The time for the delivery of stocks was changed from 1 P.M. to 2:30 P.M. on the day follow

ing. The penalty for wash trading was made expulsion. Mines will be listed on the application of 10 members, and regular reports will be required from all companies listed. No reading of telegrams or papers or speaking on any matter affecting a mine will be allowed, except by permission of the President. Membership certificates will be held to cover a failure to meet contracts made with either members or the outside public.

Trading in mining shares at St. Louis has heretofore been conducted in the open exchange in a most discreditable manner, and it is to be hoped that this new exchange will impart dignity and stability to the mining stock business of that city.

Dakota Mining Stocks.

The Deadwood Pioneer gives the following quotations of the Dakota mining stocks:

Table with columns: Bid, Asked, Bid, Asked. Lists mining stocks like Iron Hill, Seabury, Spanish R., Golden Reward, Tornado, Ruby Bell, Retriever.

Horstford's Acid Phosphate

Recommended by Physicians of all schools, for the brain, nerves and stomach.

DIVIDENDS.

ASPEN MINING AND SMELTING COMPANY, No. 54 Wall street,

NEW YORK, Nov. 15, 1888. A dividend of TWENTY CENTS PER SHARE has this day been declared on the stock of this company (200,000 shares), payable at the office of the company on and after the 17th day of November, to stockholders of record. The transfer-books will be closed on November 16th, at 12 o'clock noon, and reopened on Monday, December 1st, at 10 o'clock A.M. J. L. TILTON, Secretary.

COLORADO CENTRAL CONSOLIDATED MINING COMPANY.

The regular dividend, No. 25, of FIVE CENTS per share (\$13,750) has been declared to the stockholders of this company, payable on December 10th, at the Farmers' Loan and Trust Company. Transfer-books close on November 30th, re-opening on December 11th. NEW YORK, November 8th, 1888. W. E. MANTIUS, Secretary.

DALY MINING COMPANY.

MILLS BUILDING, 15 Broad Street, NEW YORK, Nov. 19, 1888. DIVIDEND NO. 21. A dividend of TWENTY-FIVE (25) cents per share has been declared for October, payable 30th inst. Transfer-books close 24th inst. LOUNSBURY & CO.

ONTARIO SILVER MINING COMPANY,

MILLS BUILDING, 15 Broad Street, NEW YORK, Nov. 19, 1888. DIVIDEND NO. 150. The regular monthly dividend of FIFTY CENTS per share has been declared for October, payable at the office of the company, San Francisco, or at the Transfer-Agency in New York on the 30th inst. Transfer-books close on the 24th inst. LOUNSBURY & CO., Transfer-Agents.

TO STOCKHOLDERS

OF THE

SUTRO TUNNEL COMPANY.

A decree for foreclosure against the SUTRO TUNNEL COMPANY has just been entered in the United States Circuit Court, Ninth Circuit, District of Nevada, and the property of that company will be sold thereunder at an early date. The Reorganization Committee hereby gives notice that stockholders of that company will be allowed a FINAL opportunity to protect their hitherto un-assented stock, by subscribing to the new bonds and depositing their stock as heretofore advertised. Subscriptions to said bonds will be received at the Union Trust Company, No. 73 Broadway, New York, at the following terms, to wit:

55 CENTS PER SHARE, ASSENTING FROM THE DATE HEREOF TO NOVEMBER 3d, 1888, AT 12 M., and thereafter

60 CENTS PER SHARE, ASSENTING UNTIL JANUARY 2d, 1889, AT 3 P. M.

Subscribers to the bonds will receive Trust Company certificates, entitling them to the same number of shares as those deposited by them, and \$1 in bonds for each 55 cents and 60 cents respectively paid by them. Interest at the rate of 4 per cent. will be allowed on subscriptions from date of payment.

Payment should be made by check on New York to the Union Trust Company, and should be accompanied by the stock duly indorsed in blank, and an authorization to the Union Trust Company. Blank forms for this authorization and copies of circulars can be obtained upon application at the Union Trust Company's office, or at Room 19, seventh floor, Mills Building, New York.

Dated New York, October 3d, 1888. H. R. BALZTER, Chairman, GORDON MACDONALD, P. C. A. M. VAN WEL, OTTO LOWENGARD, THEODORE SELIGMAN, REORGANIZATION COMMITTEE.