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

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

SOPHIA BRAEUNLICH, Business Manager.

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A RECENTLY published article by Prof. BERNARD MOSES, of the University of California, calls attention to an episode in the monetary history of the country where the so-called Gresham's law was inoperative; the worse currency, although a legal tender, did not drive out the better. Professor MOSES shows that in California after greenbacks were made legal tender that business was still done on a gold basis. He accounts for this by the strong popular prejudice against currency and to certain legislation, according to which contracts made payable in gold were enforceable. The popular prejudice went so far that a man offering to pay indebtedness in greenbacks was blacklisted, and posted in the newspapers. Even to the present time this disinclination to receive paper money has not passed away on the Pacific coast.

In his interesting article in another column on the scope and personnel of the Mining Census, Dr. DAVID T. DAY has modestly omitted all reference to his own important part in the work, while duly recognizing that of his collaborators. It must not be forgotten, however, that much of the success attained was due to him. He recognized when the work was placed in his hands that the partial failure of this branch of the previous census was due not to inefficient direction, but to the very comprehensiveness of the plan as then sketched; and that to obtain prompt and reliable data the material sought must be a minimum. This at least being clear, it was by no means easy to secure the interest and services of competent specialists, able, through their personal knowledge, experience and influence to carry the work to success. DR. DAY'S diplomatic skill, uniform courtesy, prompt action and indefatigable zeal overcame all difficulties, and to him is very largely due the success of the special agents whose labors are crystallized in the great volume recently issued.

THE directors of the Montana Company, Limited, have finally determined to reconstruct the company. The last report of the company showed a lack of profit, and since then, while the mine has not improved, the attachment recently placed upon the property by the St. Louis Mining and Milling Company, with which it is in litigation, has injured the company's credit, making it necessary to raise funds to pay off nearly \$75,000 indebtedness to Helena banks, as well as for exploration of the mine and legal expenses. The question of raising the necessary sum by issuing debentures was considered, but it was wisely thought the better plan to reconstruct, as thereby every stockholder would be placed upon an equal footing. Under the new incorporation an equal number of shares as in the old will be assured to the stockholders at 20s. each, 17s. 6d. of which will be considered paid up. The liability of 2s. 6d. will be met in successive calls, it being the intention of the company to call for 1s. only at present.

The future of this property is considered hopeful by the directory and by Mr. RAWLINSON T. BAYLISS, in particular, who, having been manager of the property for many years, is thoroughly familiar with it. The tailings on hand, of which there are an immense quantity, are now worked to a profit, hardly sufficient, however, to meet the fixed charges of the company should the mine itself prove unproductive.

Prospecting has been energetically carried on, but although the outlook was exceedingly promising at one time, nothing of value has been discovered in depth. The management of this property has been the best probably of any of the English investments in this country, and it is to be regretted that the property is now proving unprofitable. The directors' policy is to be commended, and it is to be hoped, notwithstanding the very poor present outlook that success will again be attained.

## "MINERAL STATISTICS, TECHNOLOGY AND TRADE."

The wonderful progress which has characterized American mining and metallurgy during the past quarter of a century and which has made them standards and models for the whole world, has been due, in no small degree, to the ENGINEERING AND MINING JOURNAL. This paper has not only made those engaged in these industries familiar with the best practice in every part of the world, but it has itself created a practical technical literature of inestimable value to those engaged in mining, metallurgy and general engineering.

Its statements in all matters either of technology or trade are accepted with confidence, to merit which a paper must be above even the suspicion of venality and must have the independence and courage to expose both the profitable swindles which undermine, and the popular delusions which injure and unsettle, the foundations of the industry it represents.

The collection and publication in the ENGINEERING AND MINING JOURNAL of reliable statistics of the mineral industry of the United States within a few days of the close of each year is an unexampled achievement which has elicited the highest admiration of statisticians and business men in every part of the world. This great work has become so important that this year its publication will require a large octavo volume, which will be issued in January, 1893, and will be the most complete and valuable report on mineral statistics ever published in America.

This work is one which will certainly be indispensable to every one who desires to be informed upon the resources of his country and especially to

all interested in any manner in the mineral industry in any part of the world. It will give the statistics of production of nearly all the useful minerals and metals in nearly every country, and for the most part will include the production and markets during the current year, and from the earliest times, where such statistics are obtainable.

The most advanced practice in the chief departments of mining, metallurgy, chemical industry, etc., will be given in this volume, with detailed figures of cost, and with much other valuable original data.

This work will be published annually, supplementing each year the information given in preceding volumes and will cover the mineral industry of the whole world. We cordially invite the co-operation of those in every country, who are in possession of facts or statistics of interest to send them to us. It is evidently to the advantage of every mineral producing district, in all countries, to be represented in a volume that, unquestionably, will become the recognized, and indeed is the only, authority on the mineral statistics of the world where everything of value or interest to all countries, whether in statistics, technology or trade can be found.

#### A SOLUTION OF THE SILVER PROBLEM.

The Monetary Conference in session at Brussels has not thus far proposed any plan that even promises to give a durable solution of the vexed silver problem. The American delegates have proposed nothing new, though Senator ALLISON in asserting that there is a "unanimity of opinion in the United States in favor of free coinage," grossly misrepresented the American people, who recently, with substantial unanimity, declared that they do not desire free coinage. Let there be no mistake abroad on this point; the United States not only will not have free coinage, but it will certainly, and before long, stop its present purchases of silver.

The ENGINEERING AND MINING JOURNAL has already (November 5th, 1892) pointed out the disastrous effects of the depreciation of silver which will ensue if no effective plan for its use be proposed by the conference.

No effective or durable plan can be based on the purchase of a limited amount of the metal, all that is offered must be taken and paid for in gold or its equivalent. No plan which does not unite the interests of the participants and remove any inducement to violate it, can be permanent.

Having closely studied the silver question both from the producing and the commercial sides, we would suggest a plan which aims at an absolute, permanent, and complete solution of the problem.

Dr. SOETBEER'S proposition to make the ratio between gold and silver 20 to 1 is sound; probably no higher ratio could be maintained for many years without greatly overproducing silver, owing to improvements in its metallurgy. His proposition to use silver in all coins and certificates of a less denomination than \$5 is also good, and it would, it is estimated by some authorities, provide an additional use for some \$200,000,000 of silver. If necessary to still further increase this amount it can be done safely by requiring that all certificates of from \$5 to \$10 shall be redeemable in gold and silver in equal proportions, while certificates at \$10 or above would be payable in gold or silver at the option of holder. These propositions provide for utilizing the silver in coin or in certificates representing the metal.

What we would propose as a complete solution of the problem, not a temporary palliative or expedient, may be briefly outlined as follows: The appointment by the associated nations (which we assume would be all nations) of an INTERNATIONAL MONETARY CLEARING HOUSE, with powers:

1. To ascertain, periodically, the amount of money, that is, of gold, silver and uncovered notes, held by each country during the preceding one or two years. These amounts to form the basis for the proportions in which the several nations will join in the purchase of all silver offered.
2. Every national transaction in the purchase or sale of money to pass through the clearing house.
3. This monetary clearing house to purchase, for common account, such an amount of silver (say 25 per cent. of their holdings) from each of the silver basis countries as is necessary to put it on the bimetallic basis, and to allot this silver among all the associated countries.
4. The clearing house can issue international certificates, redeemable in gold or silver, at holder's option, for the gold and silver purchased.
5. The clearing house to determine from time to time, say at intervals of 5 or 10 years, what, if any, change in the value-ratio of gold and silver is called for by the changed conditions of production.
6. The transactions of the monetary clearing house to be published daily or weekly.

This clearing house to be composed of one or more representatives of each country and to act through the mints of the several countries as depositories, and to have a central clearing house at one of the capitals.

Such, in outline, is a plan that would render the interests of all nations identical, that would put, and maintain, all on the gold basis and would increase, beyond any limit that has ever been suggested, the facilities for international commerce, and would practically increase in an enormous degree the availability or usefulness of the world's supply of money.

The amount of money, that is, of gold, silver and uncovered notes, in the world, is, in round numbers, approximately \$10,000,000,000, of which nearly one-half is held by four nations: France having about 17 per cent., the United States 16½ per cent., Germany 9 per cent., the United Kingdom 7 per cent. England's quota in the purchases of silver would therefore be but 7 per cent. India would sell say \$200,000,000 of silver for gold, of which England would contribute \$14,000,000 and would receive the silver which would be absolutely on a par with gold in the currency of the world, and which she herself would require under Dr. SOETBEER'S plan. The other silver countries would require, say, \$100,000,000 of gold to put them on the gold basis, which would at once increase, by far more than that amount, the value of their securities held by England, Germany and France, and would vastly increase their ability to buy goods that these countries make.

Suppose the new silver offered to the Clearing House should amount to \$100,000,000 a year. Since it will be absolutely and indissolubly on par with gold at the standard ratio, no nation could lose except the very small amount by which the ratio might be lowered by the Clearing House from time to time should the production of silver increase unduly.

Under this plan, after the first purchase, the interests of all nations would be identical, and there would be no inducement, or possibility (in the face of publicity), of any nation taking unfair advantage of another.

Every one is familiar with clearing house functions and operations, and nearly all nations have appointed arbitration courts with powers. There is, therefore, nothing unaccustomed or dangerous in the plan.

The production of gold and silver, on the value ratio of 20 to 1, is now nearly equal, say \$120,000,000 of gold and \$135,000,000 of silver annually, and as more silver than gold is used in the arts, the amounts to be offered through the clearing house would be about the same of each metal.

To those who will give this proposal thoughtful consideration the outline here sketched will open up a vista of advantages to all nations and to mankind, that grow as the simple operation of the plan becomes clearer and more familiar. We commend it to the thoughtful and able men who control the destinies of nations, and to the Commission now assembled in Brussels, with the earnest hope that it will tend to the full solution of one of the most momentous questions affecting the welfare of mankind to-day.

R. P. ROTHWELL.

#### THE INTERNATIONAL MONETARY CONFERENCE.

The delegates of the monetary conference convoked by the United States government met at Brussels, November 22d, the members being Count Khevenhuller Metsch, Austria; Herr N. Beemsert Sainctlette and Montefiore Levi, Belgium; C. F. Tietgen, Denmark; M. de Foville, Têrard and Lirondaerolles, France; Privy Counsellor Glasenapp, Germany; Messrs. Alfred de Rothschild, Sir Charles Fremantle, Sir Wm. Houldsworth, Sir Charles Rivers-Wilson and Mr. Bertram Currie, Great Britain; Sir Guilford L. Molesworth, General Richard Strachy and G. H. Murray, India; Signor Simonelli and Zappa, Italy; Prince Ourchoff and M. Raffalovich, Russia; Señor Osma, Spain; Herr Hans J. Torsell, Sweden. M. N. P. Van der Berg, the Netherlands; Senator Wm. B. Allison, Prof. C. B. Andrews, and Messrs. James B. McCreary, Henry N. Cannon and John H. Jones for the United States. The conference organized under the temporary chairmanship of Herr Beemsert, Minister of Finance of Belgium, and elected M. Montefiore Levi as President.

President Levi at the suggestion of the American delegates proposed that the conference meet every other day, giving a day for the translation of plans submitted and for the preparation of the delegates. This proposition was adopted only after considerable opposition on the part of the English delegates, who, in accordance with their instructions, proposed that the conference meet every day except Saturdays and Sundays.

At the meeting held Saturday, November 25th, Senator Wm. B. Allison submitted the plans of the United States which were as follows:

"It is generally admitted that a very large depreciation of silver, as compared with gold, and frequent violent fluctuations of gold and in the price of silver incident thereto, have been injurious to the commercial and other economic interests of all civilized countries, and have caused and are causing serious evils and inconveniences to trade, the full extent of which cannot yet be measured.

"It is the unanimous opinion of the people of the United States that the establishment of a fixity of value of gold and silver and the full use of silver as a coin metal upon a ratio fixed by agreement between the great commercial nations of the world will greatly promote the prosperity of all classes of the people.

"They, however, are not unaware of the fact that public opinion in some other countries whose co-operation in a successful movement is most desirable, is not fully in accord with the American views of the practicability of such an agreement.

"They believe that a sentiment in favor of a larger use of silver is steadily growing throughout the world, and that the time is propitious for holding an international conference to consider the subject.

"The Government of the United States, while frankly disclosing its own views of the proper remedy to be applied, does not wish to impose any conditions that will embarrass any government willing to confer on the question of the most advantageous relation of silver to the coinage of the world.

"The Government of the United States for these reasons proposed a convention of the powers for the purpose of conferring and determining what means, if any, should be taken to increase the use of silver as money. The United States delegates, in conformity with the general purpose of the conference submit the following resolution:

"That, in the opinion of this Conference, it is desirable that means be

found for increasing the use of silver in the currency systems of the nations of the world.

In presenting, as requested, a further programme the delegates of the United States consider it due to other nations that an opportunity be afforded them to consider plans other than those offered by the United States.

"It is our desire and expectation that the powers represented submit proposals looking to this end. We desire that these proposals shall have precedence in discussion.

"In addition to other plans that may be presented we submit the following, which are suggested by recognized authorities: First, the plan which Moritz Levi proposed in the Conference of 1881; second, the plan of Dr. Soetbeer; and, lastly, our own plan.

"The Government of the United States believes that the re-establishment and maintenance of a fixed parity between gold and silver, and the continued use of both as coined money of full debt-paying power would be productive of important benefits to the world.

"These ends will be accomplished by the removal of the legal restrictions now existing and the coinage of silver into full legal tender money, restoring by international agreement a parity of value between the metals at such a ratio as the Conference may decide upon. The essentials of such an international arrangement should be:

"(1) The unrestricted coinage of both gold and silver into money of full debt-paying power.

"(2.) Fixing a ratio in the coinage between the metals.

"(3.) The establishment of a uniform charge, if any, to the public for minting gold and silver coins."

In explaining the position of himself and his colleagues Senator Allison said that while they came representing the Government of the United States and favoring the bi-metallic plan they were willing to discuss any plans calculated to promote an increase in the value of silver bullion.

With singular unanimity the people of the United States were in favor of the free mintage of silver. It was to their interest, as well as to the interest of the other nations of the world, to secure, under an international agreement, a stable standard of value.

These proposals were coldly received. Mr. Tirard, one of the French delegates and formerly Minister of Finance, led the opposition, saying that he would have to decline the consideration of the proposals until he had communicated with his government. Many of the other delegates took the same ground. The Austrian and German delegates said that they had been instructed to say that they could not assent to any change in the present monetary laws. The Dutch, Spanish and Mexican delegates stated that they were ready to vote in favor of the resolution while the Russian, Italian and Swiss delegates stated that their instructions did not allow them to vote on such a resolution. During the discussion Mr. Alfred de Rothschild said that he would submit a plan on November 28, following which announcement, Senator Allison requested that action on the American proposals be postponed until Mr. Rothschild's plan was made public.

The Mourtz-Levi plan was that submitted to the International Monetary Conference of 1881. The plan of the late Adolph Soetbeer as published by the Vienna *Neue Freie Presse*, August 1st, recommends that the gram of fine gold be the universal unit of value. No nation will coin gold in pieces weighing less than 5.8065 grams of fine gold, and gold coins of lower value in circulation at the time of the agreement to be withdrawn within five years. It permits the free coinage of legal gold coin by individuals on payment of a seigniorage of two per thousand. The issue of gold certificates against a gold reserve is also permitted, but no notes or certificates of less value than 5.8065 grams of fine gold to be issued. The plan recommends the coinage of silver upon a ratio of 20 to 1, the chief coins to be one, two and five shillings, marks or francs, and that silver be a legal tender for payments up to £3, 75f or \$20. All silver coins below a certain fixed standard to be withdrawn and the coinage to be under the sole control of the State.

Silver certificates may be issued by money offices and provincial banks against deposits of legal silver coin, but no certificate to represent less than 10 shillings, marks or francs, or \$2. Finally each of the States signing the agreement to give notice within two months of each calendar year of all changes made during the year in its coinage. On Monday, November 28th, Mr. Rothschild, in submitting his plan, said that bimetalism in England is absolutely impossible, but that the question arises whether it is possible to extend the use of silver generally and by this means assist in checking a further fall in value. He recalls the fact that the Bank of England in 1886 obtained the opinions of its directors on the subject of bimetalism and that he himself then gave an opinion which was published in the Report of the Royal Commission. Referring to this, he says:

"I refer thereto in order to remind you that the question was seriously discussed not many years ago, and I felt strongly on the subject then and have no reason to regret or modify my views. I have since felt that a gold standard in England is the only possible one, and if we consider that her whole commerce and a great part of that of other countries is carried on by bills of exchange on London, which are naturally payable in gold, it must be admitted that the world generally transacts business on a gold basis, and that a double standard, with the exception of a very modified form, does not exist even in those countries professing to pay in either metal.

"Now it is proposed to revert to the situation existing prior to 1873, and open all or a part of the mints of Europe to the free coinage of silver, and to discuss the ratio to be fixed. The result of the adoption of such a course would be that the Bank of England notes would cease to represent sovereigns and would be payable in a depreciated currency, because the bank could not pay gold if at the same time purchasing an unlimited amount of silver. The bank's stock of £25,000,000 of gold would soon disappear, and it would be replaced by silver. Whatever international agreement should be made and whatever ratio should be established, gold alone will always be chosen as the favorite medium of settling large debts or making large remittances. It would be impossible to remit large sums of silver abroad owing to the bulk. Gold would be sent even if it had to be bought at a premium."

Referring to the depreciation of silver, he said in addition:

"Germany's action in 1873, and the action of Italy, Russia and Austria in amassing gold, is conclusive proof of the appreciation of great Euro-

pean countries of the advantage of a gold standard. England owes a great part of her wealth to the confidence felt in her monetary system, which has inspired at home and abroad a confidence based on the knowledge that a bill drawn on England from anywhere would be payable in gold. England has ample bullion and notes to carry on her enormous transactions; her banking system is as perfect as possible. England's commerce has flourished under these conditions, and it would be dangerous, possibly suicidal, to try to introduce an innovation in her currency system.

"Even if the bimetalists' contention is correct, that a fall in silver has reduced the prices of certain commodities, I am unprepared to say that it is a misfortune for England or the world. I cannot deplore the ability of Indian exporters to send wheat to England simply because it interferes with the British farmer. I hold that wheat at 30s. instead of 45s. is a blessing rather than otherwise. However, I think that the fall in price of certain commodities is due to overproduction, chiefly owing to the development of new regions and to the increased facilities of communication enabling products to be placed at low prices in European markets.

"Apart from other considerations, it seems to me that a universal arrangement of the currency question is impossible. As the wealth, resources and expenditures of no two countries are alike it would be impossible to carry on the trade of the world on a sound, stable basis if the debtor was allowed the option of paying in whichever currency suited him.

"Although I hope that I have shown that bimetalism is impossible in England, the question arises whether or not it is impossible to extend the use of silver, thereby stopping a further fall and its disastrous consequences, whereof it is impossible to foresee. I, therefore, submit the proposal, not as an absolute, lasting remedy, but as a palliation.

"If you approve the plan, you can make supplement to it in any way you think proper before submitting to your Governments. I think that such an arrangement will give general satisfaction. I believe that our American friends will find it acceptable. I see no objection to silver being made a legal tender in England up to £5. I believe that the proposal will be well received in India. The bulk of the population will reorganize that no material alteration is suggested, while the merchants and bankers will know that the exchanges are given a stability which will remain undisturbed during a period of five years. Unstable exchange more than depreciation of the rupee is the chief factor of complaint in India.

"The gold market will also be relieved, as only European appeals will be made thereto for a long time, and as South Africa is increasing her output of gold, the arrangement suggested will enable Russia and Austria to complete purchases without unduly interfering with the money market.

"If the conference adjourns without having accomplished any definite result, it will cause a fall in silver frightful to contemplate. It will cause a monetary panic of which it is impossible to foretell the far-spreading effects.

"I allude to India because the cessation of the Indian demand for silver, or a material decline in the rupee owing to specific legislation, would materially affect not only the savings of hundreds of millions of people, but the value of silver generally. I therefore hope for your ultimate approval, as, although it may be urged that countries not so interested as England and India are expected to make sacrifices, I yet believe that what is best for the world generally must prove best for individual interests."

This plan, of which but a brief synopsis has been cabled over, provides that the United States shall continue buying 54,000,000 oz. of silver under the Sherman Act for a period of five years and that a syndicate of European nations will annually buy silver to the value of £5,000,000, or until such a time as the price shall rise above 43d. per fine ounce, when European purchases will cease until the price falls to the said 43d.

Upon motion of M. Raffalovich a committee was appointed to report upon the plans of MM. Rothschild, Levi and Soetbeer.

Mr. Tietgen, of Denmark, who is a monometallist, has proposed the coinage of silver five-franc, four-shilling, or dollar pieces, rated to gold according to the price of silver in the year previous to the adoption of an international agreement, with a seigniorage of 10%.

He has also proposed the appointment of a permanent international commission to fix the initial price. Should the price of silver fall to 5% below the coinage ratio the Commission will have authority to fix a new ratio and order the recoinage of the pieces.

These coins will be legal tender internationally, banks to keep them as a reserve against notes, and to have the right to demand gold in exchange for them at any time from the Government issuing the particular coin held.

Upon request Mr. Tietgen consented that his plan might be considered in connection with that of Rothschild and as an addendum to it.

#### 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.

*Engineers' Surveying Instruments, their Construction, Adjustment and Use.* By Ira O. Baker, C. E., Second Edition. Published by John Wiley & Sons, New York, 1892. Pages 391. Price \$3.00. Illustrated.

*The Elements of Graphic Statics.* By L. M. Hoskins. Published by Macmillan & Co., New York and London. 1892. Pages 191. Price \$2.25. Illustrated.

*The Metallurgy of Lead and the Desilverization of Base Bullion.* By H. O. Hofman, E. M., Ph. D. Published by the Scientific Publishing Co., New York, 1892. Pages 414. Price \$6.00. Illustrated.

**Deep Level Mining on the Witwaters Rand, South Africa.**—A company acting on the report of Mr. Hamilton Smith, Jr., who has recently visited the Transvaal, has been organized to work the main reef and, we believe, other reefs, in depth. It is stated that there are fair prospects for the continuance of the productiveness of these veins to no inconsiderable depth. The ore, as is already shown in the present workings, will be baser and will require other processes than free amalgamation. In all probability barrel chlorination will be adopted.

## THE SCOPE AND PERSONNEL OF THE MINING CENSUS.

By David T. Day.

The work of making a census of the mines of the United States has just culminated in the publication of the final volume on that subject entitled the "Mineral Industries in the United States." The publication of this volume has been largely anticipated by bulletins giving in condensed form nearly all the important facts as they were developed in the progress of the work, and the volume itself is a better place for consulting the considerable amount of information than the small space which could be devoted to it here. This seems an appropriate time and place, however, to review the course of the undertaking and to publish some of the guiding ideas which have determined the character and scope of the final report, the volume is very different from the corresponding report of the Tenth Census, which will naturally be used as the measure of its value. It will be observed at first glance that many features of the Tenth Census report, and indeed the very ones which have made that volume a most interesting work of reference, have been omitted entirely, and by design. As a matter of fact it has been generally understood that one of the guiding principles throughout the present census was more limited scope.

When the writer was asked by the superintendent to formulate a plan for a census of the mines, only those lines of work were selected which could not easily be carried out by any other agency than a national census. Of the many themes of this character only those were finally taken for which there was abundant evidence that they could be carried through successfully for the entire United States and yield intelligent results. There were, to be sure, many other interesting matters which were capable of general treatment, but each additional contribution of fact by the producers added greatly to the strain on their patience and would inevitably delay the results. This consideration led to abandoning even such tempting topics as those relating to accidents in mining, details of materials used, and everything in regard to mining methods. Finally, for the reasons given above, the inquiry was limited to an enumeration of the productive mining establishments of the country, the amount and value of their products, the number of persons who obtained a livelihood by these industries, the total amount received as wages by these employes, the number of days in a year on which they received steady employment, and the principal items of capital concerned in mining operations. Of course, the schedules of questions were not identical for all branches of mining, but they all tended to produce results comparable with each other.

It is surprising how large the class of people is who must be entirely dissatisfied with this limited scope for a mining census. One class certainly expected that the various technical processes of mining would be fully treated, and others that the investigation would be extended to descriptions of the undeveloped mineral resources of every locality and which would only differ from the usual enthusiastic reports of the local experts by being more detailed and complete. It is perfectly evident that such work as this pertains rather to the geological branch of the public service. Abundant experience has shown that complete technical statements for all branches of the mining industry are out of the limits of time for a census.

The work of collecting the data and compiling it was divided at the outset according to the material industries to be considered and not by geographical divisions. It was comparatively easy to find men expert in regard to a particular industry, as the production of iron ores, or copper, or lead, but impossible to get representatives of sections of country equally well posted in regard to all the minerals. Each industry thus furnished the field for a separate investigation extending over the entire country. The selection of the experts for the charge of these several investigations was intrusted to the writer by the superintendent. It was rendered comparatively easy because of similar work prosecuted for years past under the U. S. Geological Survey, by which a competent corps of authorities had already been gathered.

First among the personnel of the Census work, which the publisher of this journal has offered to illustrate, is Superintendent Robert P. Porter. He is too well known to the readers of the JOURNAL to require any introductory remark. Among the personal elements which have made the publication of the report possible at this date, the specialists have had the advantage, not only of Mr. Porter's unusually vigorous methods of executing work, but of his phenomenal quickness in grasping new ideas of the peculiar requirements of the mining industry, his concessions to necessary variations from established routine, and as this report appears even before the compendium, in which the Superintendent is always especially interested, a spirit of fair treatment of the rivalry for first honors is too evident to need further emphasis. To the writer the most appreciated characteristic of the Chief has been that of confiding the choice of men and methods to the experts themselves and justifying himself by the increased responsibility which this devolved on them.

Copper, lead and zinc were treated by Mr. Charles Kirchhoff, editor of the *Iron Age*, New York, who has collected the same statistics for the reports "Mineral Resources of the United States" since the beginning of that series. Previous to this series very little reliable information had been published for these metals. The total annual product was not known, and by no means easy to ascertain. Nevertheless the statistics were collected thoroughly and completely with no resources other than those commanded by the experience which Mr. Kirchhoff had gained in the course of his technical and editorial work.

The subject of iron ores was naturally taken by Mr. John Birkinbine, of Philadelphia. For several years his work as an expert in furnace construction and other branches of the iron industry have led him into a careful study of many iron ore deposits and this resulted in repeated essays on the subject for the United States Geological Survey. Here again the task was by no means an easy one. Complete statistics of iron ores had not been attempted since the Tenth Census. The admirable reports of Mr. Swank on pig iron, together with the statements of the output of iron ores in prominent localities, supplied the principal statistical needs. Of the many difficulties in the way of an exact report of the produce of iron ores, it is hardly necessary to speak. They have been sufficient to keep any other enterprising authority from attempting the problem.

The collection of the statistics of gold and silver was allotted to Mr. Richard P. Rothwell, editor of the *ENGINEERING AND MINING JOURNAL*. It was determined that this inquiry should furnish an independent contribu-

tion to the statistical knowledge of the precious metals in addition to that annually furnished with great accuracy by the Director of the Mint. These statistics by the Mint are obtained principally from deposits of gold and silver at the mints and from the smelters, and from the census standpoint it seemed advisable to begin with the mines, and determine the product in that way. This method offered manifest advantage in the problem of tracing the precious metals to the localities from which they were produced. To find and separate the actually producing mines from the mere prospects was one of the most difficult problems to be solved and the one for which Mr. Rothwell's great experience and knowledge of Western mines was most valuable.

The result is very satisfactory; indeed, the independent results have been carefully compared with the Mint's work, and the discrepancies have been investigated carefully by experts on the ground. The final report is beyond question the most reliable statement of the product yet published in this country. Only a brief statement of the results has been published in advance of the complete report, and practically nothing of the detailed tables and the comparisons of the product with previous years and with foreign countries. Mr. William Kent, who acted as Mr. Rothwell's principal assistant, is given high credit in the report for the efficiency of his work. The records of Mr. Rothwell's experience made it practicable to admit some interesting technical data concerning the economical treatment of gold and silver ores in certain important cases.

Mr. James Butterworth Randol, who has been the recognized authority in the collection of quicksilver statistics for many years was naturally requested to assume the same field for the census. Once assumed, he carried the work through in spite of very severe illness at a critical time in the work, and finished it promptly notwithstanding a long and embarrassing period of snow blockade which would have been fatal to the work of any one who had not been able and willing to throw his personal resources to the aid of the undertaking. It was possible to supplement the statistical statements in the case of this industry by the technical records of the principal producer, the New Almaden mine, of which Mr. Randol was manager, and thus a very complete study was furnished of a mining industry which has already reached and passed its prime in this country.

Dr. Charles A. Ashburner and Mr. John H. Jones assumed joint charge of the coal statistics. Both of these experts are well known among statisticians and mining engineers. Dr. Ashburner was the mining expert for the Westinghouse interests when the mining census began. He had retired from the position of geologist in charge of the Second Geological survey of Pennsylvania, but was still engaged in bituminous work and in preparing annually the coal report for the United States Geological Survey. The extra work of the census was more than one man could carry, and after contributing many valuable suggestions as to the scope of the work he died before the work had more than begun. The entire field of coal statistics then fell to Mr. Jones, the well known anthracite coal statistician.

Stone production had been treated by the Tenth Census, and then was abandoned again until revived by Dr. William C. Day, who, from having a branch of that work on the Tenth Census, made a more and more complete canvass each year among the principal producers for the Geological Survey. It was a herculean task, however, to secure a list of addresses of the thousands of quarries, large and small, over every portion of the country, and another difficult matter to educate the producers to give intelligible returns within a few months. Fortunately, however, the results were obtained, compiled and sent in for publication in advance of all other mineral industries.

Mr. Joseph D. Weeks, editor of the *American Manufacturer and Iron World*, prepared the entire volume on wages for the Tenth Census, and the report on coke and glass materials, and has moreover made a complete census of the coke industry annually since that time. He has also prepared the reports on petroleum, natural gas and manganese, and consented to assume charge of these subjects for the census of mining, and also of the glass industry and coke in the manufactures branch of the census.

A new branch of inquiry at the Eleventh Census was a statistical compilation of the finds of precious stones. Nothing of this kind had been attempted at a national census, but still the want had been anticipated by Mr. Albert Williams, Jr., who had inspired Mr. George F. Kunz, the gem expert of Tiffany & Co., with a statistical zeal and perseverance sufficient to furnish good results even in this difficult line. There are few regular mines for precious stones in this country, and the work of tracing the occasional finds of gems, amounting in all to a considerable total value, is one which must be tried to be appreciated. Fortunately Mr. Kunz had just put himself in a particularly favorable position for this work by publishing his masterwork, "The Gems and Precious Stones of North America." With all of this preparation the work for the Eleventh Census was completed promptly and satisfactorily.

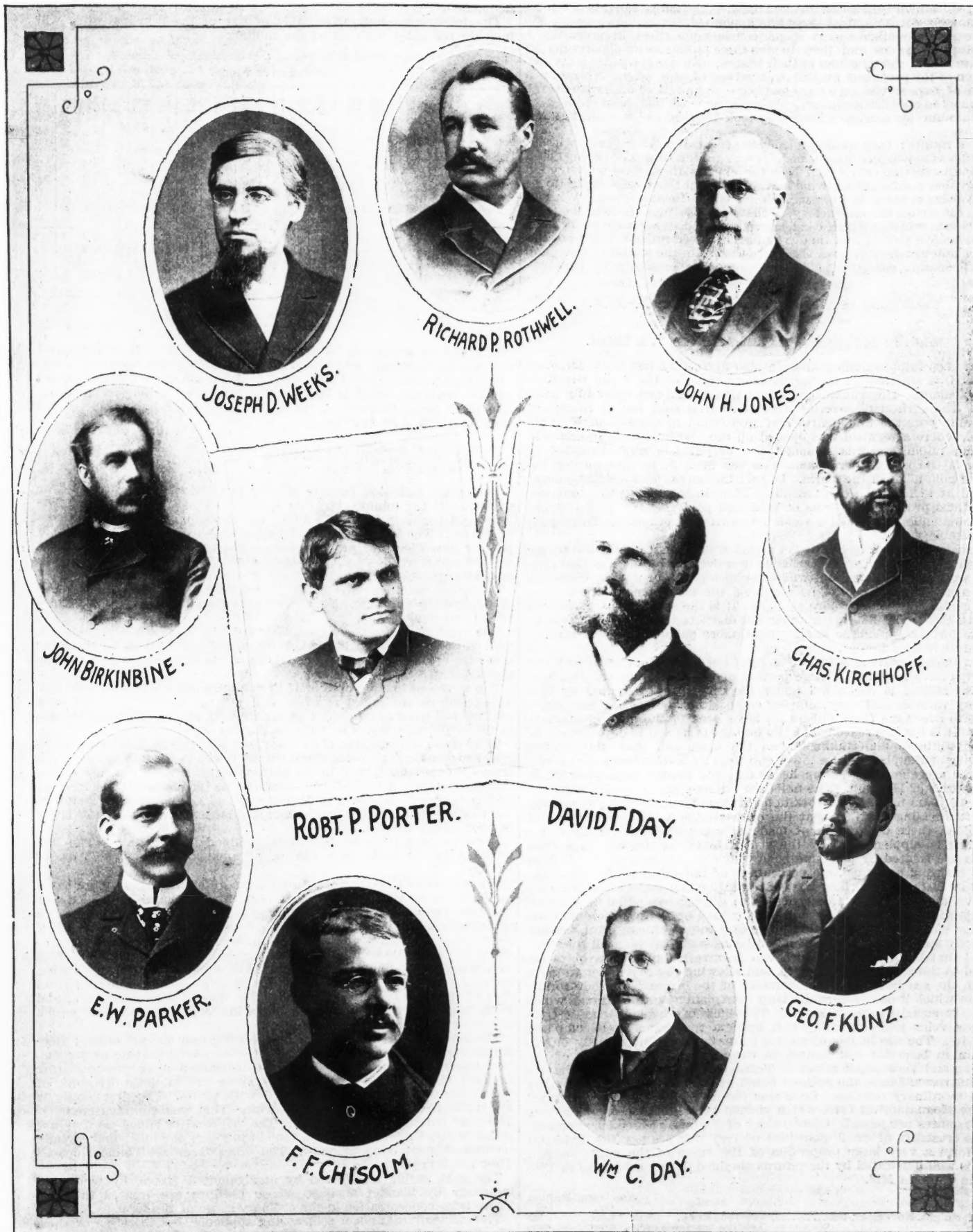
Another new industry since the Tenth Census is the production of aluminum, which has always been looked after for the Geological Survey by Mr. R. L. Packard, who took this occasion to go back into metallurgical history and give the world's product of that interesting metal.

The industry of producing and selling mineral waters is another subject not treated by any previous census. Dr. Albert C. Peale acted as the expert for this subject.

The writer takes especial pleasure in heartily acknowledging the part which Mr. E. W. Parker has filled among the personnel of the Mining Census. Mr. Parker was called from the managership of the *Statesman*, of Austin, Texas, to assume charge of the executive work of the mining branch; he was to be the "red tape" expert, but he was much more than this. He acted as the personal representative of the writer and assumed entire charge during periods of absence, and also conducted and published no less than 18 statistical investigations, while also disciplining from 20 to 30 clerks. With all this, no one ever succeeded in disturbing his eternal, phenomenal good nature.

In the Rocky Mountain region Mr. Frederic F. Chisolm, M. E., acted as my personal representative, and also directed the canvass of all the mines which could not be reached by correspondence. His selection for this complicated task was a foregone conclusion from his previous connection with "Mineral Resources of the United States," and his wide acquaintance with the mining conditions and miners in the West.

Mr. Charles G. Yale, editor of the *Mining and Scientific Press*, collected all the statistics of precious metals and other minerals except quicksilver



THE PERSONNEL OF THE MINING CENSUS.

in California. Mr. Yale's results, in point of time, accuracy and phenomenally low cost, can only be accounted for by his utter contempt for stenographic or other office assistance. He did everything himself, selected his own field assistants, and finished the entire canvass in almost less time than was required to get him appointed.

The general method was to spend considerable effort in preparing a directory of mines and then to give these producers an opportunity by mail to fill out the schedules at their leisure. An unexpectedly large proportion of the producers availed themselves of this plan. Meantime a corps of expert visiting agents had been organized which expanded the personnel to over 200 specialists. When their work had been reduced to a minimum by correspondence they took the field and brought in tardy returns.

As to results: they would probably be accepted by the majority without question as to whether good or bad. There are few means of testing them. The most exacting critics have been the experts themselves who stood in the peculiar position of knowing in advance what the results ought to be and waiting to see if the census method could furnish them. Without doubt the results are satisfactory; so that each has more faith in the practical results which a census can accomplish. It does not seem to the average statistical guesser that these results have been prompt, but there has been a noteworthy gain over the Tenth Census in the matter of time, and the information was given publication even more promptly by bulletins.

#### VARIATIONS IN THE MILLING OF GOLD ORES.—NO. 2. THE THAMES, NEW ZEALAND.

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

This once famous mining district, also known by the Maori name of Hauraki, is situated on the northeastern coast of the north island of New Zealand. The Thames gold field was proclaimed upon July 28th, 1867. The earliest discoveries were of alluvial gold, but in August of the same year the first quartz reef was found in the bed of Kuranui Creek, where afterward was opened up the Chotover claim, famous in colonial mining records. Though the output has now dwindled to about 30,000 ounces per annum this has been in its day one of the richest gold fields of the world. In 1871 the output was 330,326 ounces, valued at £1,188,708. The Caledonia Mine in the first twelve months' operations produced ten tons of gold and paid £600,000 in dividends. The Moanataeri, Manukau, Golden Crown and others similarly gave remarkable yields.

Though the mines have not yet attained any great depth, 600 to 700 ft. being the maximum, the veins have proved to be far less rich than they were near surface, and while the opening up of new districts has drawn away many of the best miners, the development of the gold field is also crippled by share jobbing. It is the story of many another mining camp, and like many other old districts the Thames is worthy of the further systematic development, more particularly near surface, which its history invites.

Few mining districts have had so brief but brilliant a record, and few perhaps have lost such a large portion of the gold extracted from the mines. Milling is conducted under the difficulties presented by ores of very variable and very complex composition, but so far the efforts made to overcome those difficulties have been of the most elementary kind. It is for this reason that the tailings mills are to-day among the most profitable undertakings upon the field, and that the mining industry of the place is at a lower ebb than its history has ever known.

There are about 500 stamp heads and 350 Berdan pans at work in the district of Hauraki. The mills are without exception old and date 10 to 17 years back. The work done in them is most incomplete, since, notwithstanding the fact that the ore contains a large percentage of sulphides, there is no attempt made at concentration. Ordinary wet crushing is supplemented by the use of blankets, the washings from which are treated by pans, methods which do not prevent the tailings from carrying away a large percentage of the value of the ore. The tides in their ebb and flow are concentrating the material which they receive, and are giving a daily lesson to the careless millman, a lesson unappreciated by him, but readily understood by the proprietors of the tailings plants who are making money by the treatment of the sands.

Briefly stated, the method of milling consists in catching all the "free gold," that is all the gold which can be arrested by means quite unsuited to the character of the ore, and allowing the remainder to go to enrich the sea beaches. The character of the ore and the lode formation in which it occurs partially help to explain a state of things which calls for such severe criticism. The bulk of the gold comes from narrow veins and extremely rich pockets traversing a decomposed andesite. The ore bodies of such a formation must necessarily be uncertain in behavior and limited in extent. Like the deposits of the Nagyag and Veraspotak mines of Transylvania,\* to which they have a striking resemblance, the pockets found at the Thames are occasionally of extraordinary richness. Such was the lot of 2 tons 8 cwt., crushed by the Moanataeri in 1878, which yielded 14,600 ounces, or at the rate of 2½ ounces per pound. One bowlder of 2½ cwt. yielded 3,500 ounces. These crushings of small quantities of very rich ore pay the dividends and form a very large proportion of the value of the entire output. This is well illustrated by the returns obtained during six weeks in 1885 by the Cambria Mill.

		Amalgam.	Bullion.
		Oz.	Oz.
First fortnight, November, 1885.....	235 tons stone.	1,524	585
	1,490 lbs. specimen ore.	6,088	2,312
Second fortnight, November, 1885 ..	293 tons stone.	2,031	777
	1,533 lbs. specimen ore.	4,531	1,802
First fortnight, December, 1885.....	286 tons stone.	1,600	583
	1,970 lbs. specimen ore.	8,115	3,229

\*It is indeed very curious to note how striking is the similarity of the ore occurrence at two places so far apart as the Thames and Transylvania. The country rock of both is similar, the ore deposition is very alike and it is difficult to distinguish the gold specimens of the one from the other. The bullion of both is of very low grade and contains one-third silver.

The bulk of the output being thus of a value small in proportion to its weight when compared to that of a few sacks of "specimen ore," it is easily conceivable that it has not received the attention which it demanded.

The following comparative table of five of the principal mills will indicate the chief features of the milling:

Name of mill.	Number of stamps.	Weight of stamps, lbs.	Number of drops per minute.	Height of drop, inches.	Average depth of discharge, inches.	Capacity per head, tons.	Capacity of mill, tons.	Description of screen.	Number of holes per sq. in.	Finesness of bullion per 1,000.	Percentage in retort— in.	Life of the screen, days.	Loss of mercury, dwts. per ton of ore.	Number of Berdians.	Number of other pans.
Saxon.....	32	785	72	9	2½	1.8	58	R'd punch'd Russia iron.	148	663	42	6	14.5	8	3
Moanataeri.....	40	659	66	8	2	1.4	55	"	170	611	40	6	15.2	21	4
Cambria.....	20	620	76	9	3	1.7	35	"	180	674	40	5	....	15	..
Kuranui.....	20	670	70	5½	2¼	2.5	50	"	160	665	45	5½	....	7	..
Comer.....	20	840	63	6	2½	3.6	72	"	160	585	48	5	....	5	..

No concentrates are obtained in any of these mills.

It would be wearisome to describe each of these mills in turn, so I will choose the Saxon, which is perhaps the most representative.

The Saxon Mill contains 32 stamps, which crush the ordinary ore, and one single stamp, which is kept for the treatment of the specimen ore. The plant bears evidence of its growth in the varying weight of the stamps, which is as follows:

Ten "light heads" in 2 batteries of 5 each.....	5 cwt. 1 qr.
Twelve "medium" in 2 ".....	6 " 4 "
Ten "heavy" in 2 ".....	7 " 0 "

The shoes and dies vary in similar proportion. The rate of drop averages 72 per minute, but this speed is subject to variations. The height of the drop is from 8 to 11 in., depending upon the hardness of the ore. The issue or depth of discharge is about 1 in. at the time of putting new dies into position, and increases to a maximum of 4 in. as they are worn down. There is no attempt made to keep the depth of discharge constant.

The single stamp weighs 7 cwt. It is given a 7-in. drop and a speed of 60 drops per minute. This "specimen stamp" is a curious feature of all the mills.

The crushing capacity of the mill is from 30 to 35 loads per day. A load varies from 30 to 35 cwt. When not engaged in treating the specimen ore the single stamp assists the other 32 in the crushing of the general output of the mine.

The screen or grating used is of Russia iron, imported from Swansea. The openings are round punched and 148 per sq. in. The life of a grating will average one week of six working days. (No work is done in the colonies at mines or mills on Sunday.)

The loss or consumption of mercury is at the rate of one bottle (of 75 lbs.) per month, there being three bottles in use in the mill at any given time. No mercury is used in the mortar boxes, save in the case of the specimen stamp; it is employed, however, on the plates outside, in some of the "ripples" or wells, and in the pans. Owing to the "flouring" produced by the pans the loss of mercury is excessive, being 14½ dwts. per ton of ore treated.

Forty-two per cent. of bullion is obtained in retorting. The last crushing of 30 loads gave 479 oz. of amalgam, yielding 203 oz. of bullion.

We will now follow the ore through the different stages of the treatment. It is brought to the mill in carts and discharged into stalls or ore bins behind the batteries. There is no rock breaker in use, no grizzlies or sizing bars, and the ore is hand fed. The feeding is badly done. The ore varies greatly in hardness, according to the extent to which the andesitic vein filling is decomposed. The quartz itself is often sugary and crystalline. The shoes and dies, both of local manufacture, are made of white hematite cast iron, that of the die differing from that of the shoe in being unchilled. The shoe is 9½ in. in diam., and 10 in. high. The die is 10 in. diam. and 4 in. deep. The die is cast with a flange so as to keep it in position.

The mortar boxes are faulty in design since they are too roomy; there is unnecessary space in and around the dies, seeing that no amalgamation takes place inside. The pulp is discharged upon amalgamating tables 7 ft. long and 4½ ft. wide. These are in three divisions, of which the upper two only are lined with plates. The first length is 2½ ft., inclusive of a well 2½ in. wide. This well contains mercury. The next length of table is 18 in. The "ripples" or riffles, as they are called in the United States, are four in number, one only, that already mentioned, containing mercury. The other three are "blind ripples." They are 2 in. deep.

The gold saving is effected by amalgamated plates, by wells and indirectly by blanket strakes, whose residues are treated in pans. There is no concentration in the ordinary sense of the term.

The mortar box is not a gold saving appliance, but merely a crusher. The first amalgamation takes place on the outside plates. These are made not of copper, but of Muntz metal. They are roughly cleaned up every 4 hours. The wells are of very little assistance, wells per se are unsuited to ores containing a notable proportion of sulphurets. The surface of the bath of mercury is continually coated with a scum of sulphurets, which prevents contact with the gold in the pulp passing over it. Here the wells are skimmed with a cloth every 4 hours. The mercury placed in them is squeezed once per week. The six wells

(one to each battery) in the mill catch about 12 oz. of amalgam out of the weekly yield for the entire mill of 200 to 250 oz.

The "blind ripples" are not true wells, since they hold no mercury. They are cleaned with a scoop every half hour, the heavy sand and sulphurets so obtained going to the pans.

The blankets are washed every hour, this interval varying, however, according to the richness of the ore and the amount of sulphurets which it contains. The washing of the blankets is done by one boy on each shift, three boys per day, each of them paid £1 per week. The blanketing goes to the pans. Of these there are 3 varieties.

Eight Berdans.....	Diameter 4 ft. 6 in.	Depth.....	9 in.
Two Watson & Denny....	" 5 ft. 4 in.	".....	2 ft. 6 in.
One Price (local).....	" 5 ft. 8 in.	".....	2 ft. 7 in.

The Berdans and one Watson & Denny treat the blanketing. The other two are working tailings. The Berdans have a pitch of 16 in. in 3 ft. 6 in., or 1 in. 2<sup>3</sup>/<sub>8</sub>. The speed is regulated at 23 revolutions per minute. The amalgam is removed every 24 hours. Instead of a ball, a drag is used. It consists of two parts, the "slipper" or shoe weighing 196 lbs. and the top or boss 233 lbs. They are held together by a key, and the surface of contact between the two parts is lined with cement. The shoe lasts about 4½ months.

The distribution of amalgam, which also indicates the proportion of gold saved by the various parts of the mill, is as follows: At the fortnightly cleanup, preceding my examination of the mill, 200 oz. 4 dwt. of melted bullion were obtained from a retort of 203 oz., which was the yield from 476 oz. of amalgam, which last was thus distributed: Plates, 223 oz.; mercury wells, 24 oz.; pans, 43¾ oz.; 35 lbs. of specimen ore, 164 oz.

The balance is made up by the skimmings, etc. The amalgam obtained from the picked stone is obtained in the mortar box of the

tance from the top of the die to the bottom of the screen or grating—in all the mills is regulated by the wearing down of the dies. It varies from nil with new dies to a maximum of 5 in., and will average from 2½ to 3 in. The importance of having a depth of discharge suited to the particular mode of working aimed at and the particular ore treated is a point quite unappreciated. It is curious to note that in most districts the importance of this feature of the milling is as a general rule overlooked.

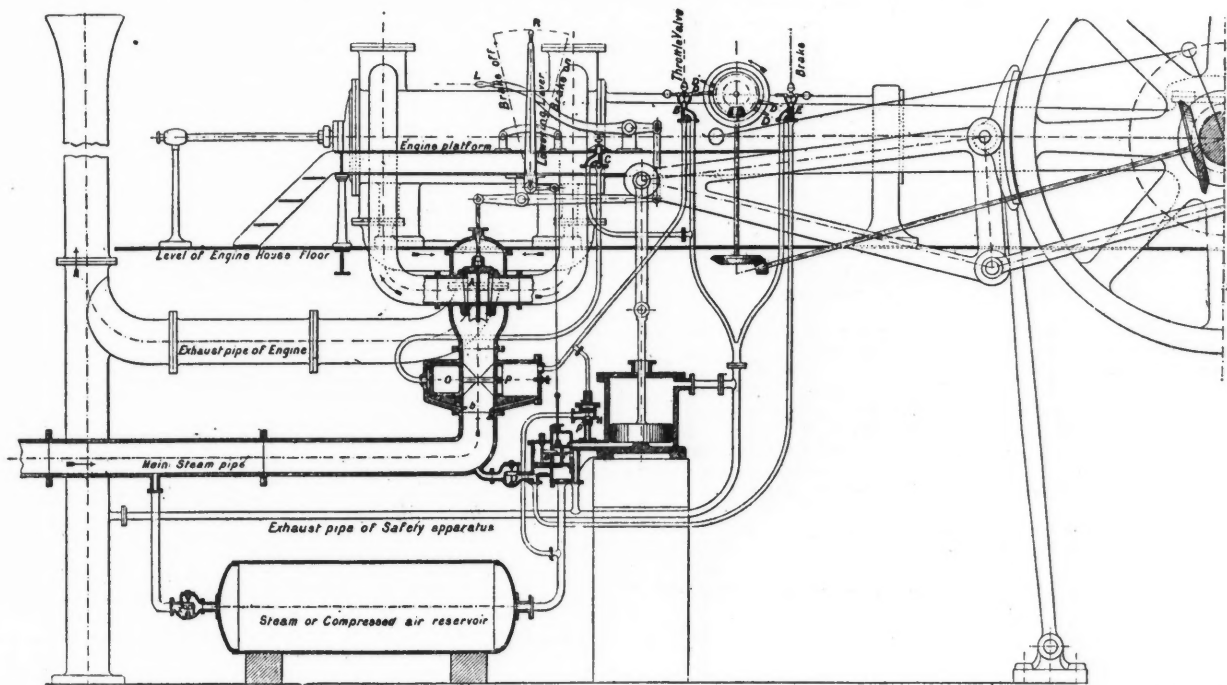
The crushing capacity varies but little for the first three mills, from 1½ to 1¾ tons per stamp per 24 hours being the average. At the Moanataeri it is lower than at the Cambria or Saxon, by reason of a shorter drop. The Cambria crushes fast in proportion to the weight of the stamps; this is due to the fact that it is a custom mill or "public battery." The slightly deeper discharge is more than made up for by the quicker drop. The Kuranui Hill mills—Hansen's and Comers'—put through a much larger quantity, since they crush soft surface material of low grade.

(To be continued.)

A SAFETY APPLIANCE FOR HOISTING ENGINES AT MINES.

The accompanying illustration shows the apparatus used at one of the Lens Colliery Company's mines at Lens, Belgium, for automatically shutting off steam when the cage has arrived at a point near the end of its up or down journey and for applying the brake. The controlling of the winding engine and the brake engine is entirely automatic and a mistake of the engineer cannot result in overwinding.

A throttle valve *O P.* of special construction is placed in a chamber in the main steam pipe, which supplies steam to the winding engine. When the engine is working, the valve is held in the position shown, as the



SAFETY APPLIANCE FOR HOISTING ENGINES.

"specimen" stamp. Mercury is always added to the copper or mortar box of the single stamp, and all the tailings are saved for retreatment in the Berdans. The power for the machinery comes from two Pelton wheels, one 5½ ft. in diam., which drives the stamps, and one 3½ ft. in diam. for the pans. The water from the small wheel is used in the batteries. The cost of water under 60 lbs. pressure is £3 per sluice head (50 cu. ft. per minute) per week. It amounts to £36 per month. A small dynamo generates the electricity which illuminates the mill at night. The ore treated gives an average yield of 15 dwts. per ton.

The following figures will indicate the cost of the mill treatment at the Saxon Mill per 24 hours with 33 stamps crushing 63 tons. This includes the "specimen" stamp; 3 feeders at 6s. 8d. per shift of 8 hours, £1; 3 boys, feeders also, at 5s., 15s.; 3 blanket boys at 3s. 4d., 10s.; 3 amalgamators at 8s., £1 4s.; total labor in 24 hours, £3 9s. One of the amalgamators is the superintendent or manager of the mill. The cost of labor is, therefore, 2s. 10½d. per ton, while the total cost, including wear and tear, alterations to machinery, interest on capital, etc., is 4s. 1d. per ton. At the Moanataeri Mill, which is a larger plant, the cost is 3s. 9d. per ton.

Coming to the examination of the comparative table it will be noted that the mills are for the most part small, being in this respect proportion to the size of the mines. The Moanataeri Mine has the most extensive workings, and owns a comparatively large mill. The weight of the stamps varies from 620 to 840 lbs. The speed varies within narrow limits only—from 63 to 76 drops per minute. In the height of the drop there is a greater disparity; the first three mills are treating ore which comes from depths varying between 200 and 500 ft. from the surface, and the drop is from 8 to 9 in., but the last two are treating soft surface material, which fact explains the comparatively low drop of from 5 to 6 in. The depth of discharge or issue—the dis-

steam pressure behind *P*, entering through the small passage *a*, balances that behind *O*, which enters through the passage *b*.

When the cage comes to a point about 100 ft. below the surface, a tappet *D* on the winding tell tale opens a valve *B*, and thus allows the steam in the chamber behind *P* to exhaust into the air. This diminution of pressure behind *P* causes the valve *PO* to shift to the right; and in this position the plunger *O* blocks the main steam pipe almost entirely, and only sufficient steam is allowed to enter the engine cylinders to balance the load in the cage. When the cage clears the bank the second tappet *D*<sup>1</sup> repeats the action of *D* for security's sake, and a third tappet *D*<sup>2</sup> opens the valve *E*, and so exhausts the steam from behind the valve *G* in the brake engine. As the valve *G* moves it opens the valve *F*, and thus allows the steam to enter the brake engine. The brakes are thus forced upon the fly wheel of the winding engine.

When the cage is being lowered the hand lever *R* is in mid-position. On the cage arriving within 100 ft. of the bottom of the pit, the tappet *D* opens the valve *B* and causes an exhaust above the small piston *H* in the brake engine. The valve *p* is thus opened and steam enters the brake engine and applies the brakes.

At the end of the up journeys, the engineer closes the admission regulator *A* by the lever *L*, and in doing so opens the valve *C* on the exhaust pipe from *O*. Thus the pressure behind *O* is temporarily released and *O* returns to its old position at the left hand side of the chamber. In order to provide against a possible breakage of the main steam pipe a reservoir of steam or compressed air is added to the plant. The contained steam or air, when the main pipe breaks, closes the valves *K* and *I* and enters the brake engine.

The inventor of this apparatus, Mr. Reumeaux, is the chief engineer to the Lens Colliery Company. His principle, often brought forward at meetings of mining engineers on the continent of Europe, is, that no safety appliance can be really efficient unless it takes part in the regular course of work.

## HARNEY PEAK TIN MINES.

By Captain Josiah Thomas.

(Concluded from page 514.)

"Gertie.—In this mine the vein has the general characteristics of a lode, but in composition somewhat resembles what I have called 'ledges.' A shaft has been sunk on the course of the lode to the depth of 400 ft. In the tunnel, which at the shaft is 100 ft. deep, there is a productive lode 2 ft. 6 in. wide for upwards of 100 ft. in length to the north of shaft. Beyond that point, for 60 ft. long, it is small and poor. At the 200 ft. level there is a good lode 3 ft. wide for 120 ft. in length, but beyond this northward it is very small. At the 300-ft. level the lode is 3 ft. wide, and productive for the whole of the 120 ft. driven north of shaft. Some parts of the lode at this level are very rich, and will probably produce 2 cwt. of black tin per ton. At the 400 ft. level the lode is 4 ft. wide, well defined, and containing good tin, which can be plainly seen for 100 ft. in length to the north of the shaft. In the last 20 ft. driven northward the lode is small. It is important to observe that this lode, unlike many of the ledges, is improving in size and quality as depth is attained, and although the good tin ground is only about 120 ft. long, yet by continuing to drive on the course of the lode other paying shoots of tin may not improbably be discovered. There are about 50 tons of rich selected ore in the house which will probably produce from 15 to 20% of tin; while samples which I took from the large heap containing some thousands of tons made an average produce of 68 lbs. of black tin per ton. Stopping has been commenced at the various levels, and there is no reason why the whole of the tin ground in the various levels above reported on should not be sent to surface and put through the mill so soon as the railway is completed.

"Butte (Truax Group).—A pit was sunk 10 ft. on a ledge 3 ft. wide. A shaft has also been sunk perpendicularly to a depth, I was informed, of 72 ft., at which level the ledge was intersected; but, the water being in the shaft, I could not get down to inspect the workings. A sample from the heap near the shaft produced 49 lbs. of black tin per ton.

"Tin King.—This ledge is situated to the southeast of Butte, and is of similar character and quality. A shaft now sinking on its course is 42 ft. deep, the ledge being 5 ft. wide.

"Dacon Wright.—A cutting 40 ft. long and 15 ft. deep at the furthest point north has been made on a ledge 4 ft. wide. It contains a large quantity of mica, and some of the stones are rich in tin. Taken as a whole, however, this ledge, so far as yet developed, is of inferior quality—a sample therefrom only having produced 5 lbs. of black tin per ton. Being situated on the side of a steep hill, a tunnel could be driven to intersect this ledge at a depth of about 300 ft. at a comparatively small cost.

"Naid Queen.—This is probably on the same ledge as Dacon Wright, and is of similar size and character. A shaft has been sunk on it to a depth of 43 ft. A sample of the stuff raised therefrom only showed a trace of tin.

"Tenderfoot.—Some very rich boulders—richer for tin than I observed in any part of the property—are scattered over the surface. The Japanzy Tunnel, driven 1,000 ft., intersected the ledge 300 ft. below the surface. This tunnel has been continued southward on the ledge 600 ft. For about 300 ft. in length the ledge is from 6 ft. to 8 ft. wide; but for the remainder of the distance to the end it is small and poor, being only from 2 in. to 4 in. wide. In the northern tunnel, which has been driven 400 ft., nothing of value has been met with. A shaft, sunk on the ledge, has been communicated with the tunnel, and another tunnel, 150 ft. from the top of the shaft, or half way down, has also been driven to the ledge. Samples taken from the large heap outside the tunnel produced 31 lbs. of black tin per ton. A portion of the stuff from the shaft and upper tunnel is of much better quality. The shaft being sunk to the tunnel and good ventilation secured, the tin ground is ready for stopping.

"Tin Reef.—Old Jeff ledge is composed of an unusually hard granite rock, containing fine-grained crystals of tin. A shaft is sunk 40 ft., and the ledge at the bottom is said to be 15 ft. wide; but, the water being in, I could not see it at the deepest point. This ledge appears to be of great strength and considerable promise. A sample taken from here produced 50 lbs. of black tin per ton.

"Flora.—A large ledge, 30 ft. wide and more, cropping up above the surface, can be traced for a great length. It has been worked on for 7 ft. or 8 ft. in width on the footwall for 120 ft. in length, and some exceptionally rich stuff has been broken therefrom. Two shafts, 25 ft. and 40 ft. deep, are down to water. A vertical shaft, calculated to reach the ledge at a depth of 150 ft., has been sunk 80 ft.; but this is also down to water, and pumping machinery will be required in order to sink it deeper. If the ledge continues its size as depth is attained, it will produce a large quantity of stuff. I recommend most strongly that the necessary steps be immediately taken to sink the shaft to the ledge as fast as possible. Samples taken from the heaps produced 39 lbs. of black tin per ton, but I understand some of the richer portions have been taken away.

"I have not attempted in this report to advance any theory as to the origin or formation of the various deposits, nor to give any opinion as to whether some of them are true fissure veins or otherwise; for, after all, these points are mere matters of opinion, and not of much practical importance. What I have designated 'ledges' appear to be, for the most part (so far as yet developed), shallow and fragmentary deposits which become much smaller in depth, dwindling down from 8 ft. or 10 ft. in width to a few inches, and in some cases to a mere wall. It is, of course, possible that they may again become larger and more productive at a greater depth, and I think it would be advisable, by way of trial, to sink at least one shaft to a depth of 1,200 ft. or 1,500 ft. As efficient pumping machinery will shortly be fixed at Addie, and as that ledge is of such great size and strength near the surface, it may, probably, be best to make such a trial at that mine. When the shaft is sunk to the depth resolved on, cross-cuts should be driven at right angles to the ledge and to a sufficient distance to prove the point in question.

"What I have designated 'lodes' are, I believe, true fissure veins; but, with few exceptions, such as Cowboy, Gertie and White Whale, they are generally small, composed largely of quartz, and of little or no value—nor, in my opinion, are they ever likely to become sufficiently productive to pay for working. Large sums of money have been spent in procuring and working many of the claims in which these lodes are found, with no

prospect of success. I understand that 150 men are at present employed in assessment work on the various claims, in order to retain possession—at a cost, I presume, of about £3,000 per month—and I strongly advise that a large number of the claims be relinquished rather than spend any more money on them by way of trial or development. This matter may, I think, be largely left to the judgment and discretion of the manager. I may here observe that if any lodes of fair size can be found dipping toward the granite instead of away from it, I should have a much better opinion of their being found productive. The new mill erected near headquarters appears to be an excellent one in every respect, and is probably more suitable than stamps for reducing ores that contain large quantities of mica. In my opinion, however, Californian stamps would be better adapted for reducing ores which are very hard, and in which there is but little mica. At some future day, when the property is more fully developed, it may be found advisable to erect stamps of that description.

"The pumping appliances hitherto used in the mines are very inefficient. They are more like toys than like machinery intended for serious work, and are only suitable for shallow workings or for mere temporary purposes. It is of the first importance in working mines that sufficient pumping machinery be provided to keep the workings free from water; otherwise the workmen will be hindered, and much unnecessary expense, as well as delays in working, will result. The mill is stated to be capable of reducing 250 tons of ore per day (which I have no reason to question), and so soon as the railway sidings are completed it should be set to work. There are large heaps ready for milling at Addie and Gertie, to which mines, I understand, sidings will first, and shortly be made. It will be desirable to put these heaps separately through the mill, keeping an exact account of the quantity treated and the tin produced therefrom. In this way the average quantity of black tin per ton of the ore in each mine can be much more accurately ascertained than by taking a few samples. Taking into account the several heaps now lying on the surface, and the whole of the ore discovered and ready for stopping in Addie, Cowboy, Coates, Gertie and Tenderfoot, above reported on, I think the mill can be kept supplied at the rate of 250 tons per day for a period of about 12 months. In order to insure this supply being kept up, however, stopping on a large scale should be commenced at once, as the heaps at surface, at the above-named rate of milling, will be exhausted in less than two months. If the quantity of stuff here specified is put through the mill in the first 12 months' working, it will produce, according to my estimates, about 1,200 tons of metallic tin, or, say, 100 tons per month. This would work out to an average produce of about 40 lbs. of black tin per ton, which will just exactly agree with the results of Mr. Beringer's assays of my samples. The cost of erecting the machinery for pumping and hoisting, as well as the cost incurred in sinking shafts and driving levels, having been already paid, a good profit ought to be made on the 1,200 tons of tin calculated to be returned in the first 12 months' working.

"In order to obtain a supply for the mill for the future, new ground must be opened up for working in other parts of the property without delay. There is, doubtless, a large amount of tin in the numerous claims owned by the company, but it is scattered over a very extensive area, and, so far as yet proved, the tin deposits are not only shallow, but are of no great length, thus making them costly to work, especially where shafts and pumping and hoisting machinery are necessary. The large rocks and boulders are generally richest for tin, and these should be blasted into smaller fragments and sent to the mill. These boulders are scattered over a great extent of country, and would therefore, appear to be very troublesome, as well as costly to collect; but if, as I am informed, the railway company is prepared to put sidings where required to the various mines, and to carry the ores to the mill from any part of the property at a cost not exceeding 2s. per ton, this is not a matter of so much importance as at first sight appears. I have already noticed in this report the most promising points for future development, and I would again especially direct attention to White Whale and the two adjoining ledges, as well as to Flora and Tin Reef, on all of which operations should, in my opinion, be vigorously carried on. I advise you not to attempt mining for ores that will produce only 10 lbs. or 12 lbs. of black tin per ton; for the greater the quantity of ground of this value worked, the greater the loss will inevitably be.

"By exercising care and caution, working the most productive lodes and ledges, and avoiding those of low quality, I see no reason why an average yield of about 40 lbs. of black tin per ton may not be maintained for a long time to come, while there is an immense quantity of ground yet to be proved and developed, some of which may be of richer quality. The profits to be made will, of course, depend not only on the price of tin, but partly on the extent, as well as the richness, of the deposits. It is easy to see that if a new shaft has to be sunk, and pumping and hoisting machinery erected for each separate deposit of 150 ft. or 200 ft. in length, the cost of working such deposits will necessarily be considerable, and unless the ore is of a tolerably high grade they cannot be profitably worked. This fact should constantly be kept in view in the future working of the mine. I can hardly advise the erection of smelting works at once, as I understand there are smelting works at Omaha, and the extra cost of carriage of black tin to that city, as compared with that of metallic tin, will only amount, I presume, to a few shillings per ton. Meanwhile, you could obtain estimates of the cost of erecting suitable smelting works on the mines, and after ascertaining the actual cost of smelting elsewhere, including carriage, etc., you can decide on the best course to be adopted."

## COX'S FORMULA FOR ASCERTAINING THE LOSS OF HEAD IN PIPES BY FRICTION

"Copyright, 1892, by William Cox, New York."

$L$  = length of pipe in feet,  $D$  = diameter of pipe in inches,  $V$  = velocity in feet per second,  $H$  = friction head in feet.

$$\text{Then } H = \frac{L}{1200 D} \times (4 V^2 + 4 V + V - 2), \text{ or } (4 V^2 + 5 V - 2).$$

The formula may be further simplified by reducing it to  $H = \frac{L \times C}{D}$

in which  $C$  is replaced by the following values, according to the velocity:

Velocity, 1 ft. $C = .06583$	Velocity, 4 ft. $C = .06833$	Velocity, 7 ft. $C = .19083$
" 2 " " = .02	" 5 " " = .1025	" 8 " " = .245
" 3 " " = .04083	" 6 " " = .1433	" 9 " " = .36583
		" 10 " " = .3733



## NEW ORE DOCK AT CONNEAUT, O.

A new ore port has been made on Lake Erie, viz., at Conneaut, O., which is situated about 14 miles east of Ashtabula and just over the boundary between Pennsylvania and Ohio. A branch of the Pittsburg, Shenango & Lake Erie Railroad will control the distribution of the ore. About a quarter of a million dollars have already been expended in forming a harbor and erecting ore hoists, and by next spring the dock facilities and accommodation will have been further increased. There is a channel 18 ft. deep and 120 ft. wide, extending for a distance of 2,000 ft. along the dock, and the natural features of the district will allow of the channel being extended for two miles at very light cost.

The accompanying illustration shows the three ore hoists erected by the Brown Hoisting and Conveying Machine Company, of Cleveland, O., who, by the way, have supplied fully 75% of all the ore hoisting machinery that has been erected at Lake Erie ports. When the photograph from which the illustration was prepared was taken the storage and loading yard were not completed, but we understand that they are in working order now, and the first cargo of ore was unloaded about three weeks ago. Each of the three bridges is 180 ft. long; the aprons which lower over the hatchways of the vessels are 34 ft. long, and the cantilever extensions at the other end are 92 ft. long. The piers at each end are mounted on wheels, and move on tracks parallel to the front of the dock. There are three double cylinder hoisting engines, with patent band friction

## THE MINES OF THE MARY LEE COAL COMPANY, ALA.

Written for the Engineering and Mining Journal by Robert Mauchline.

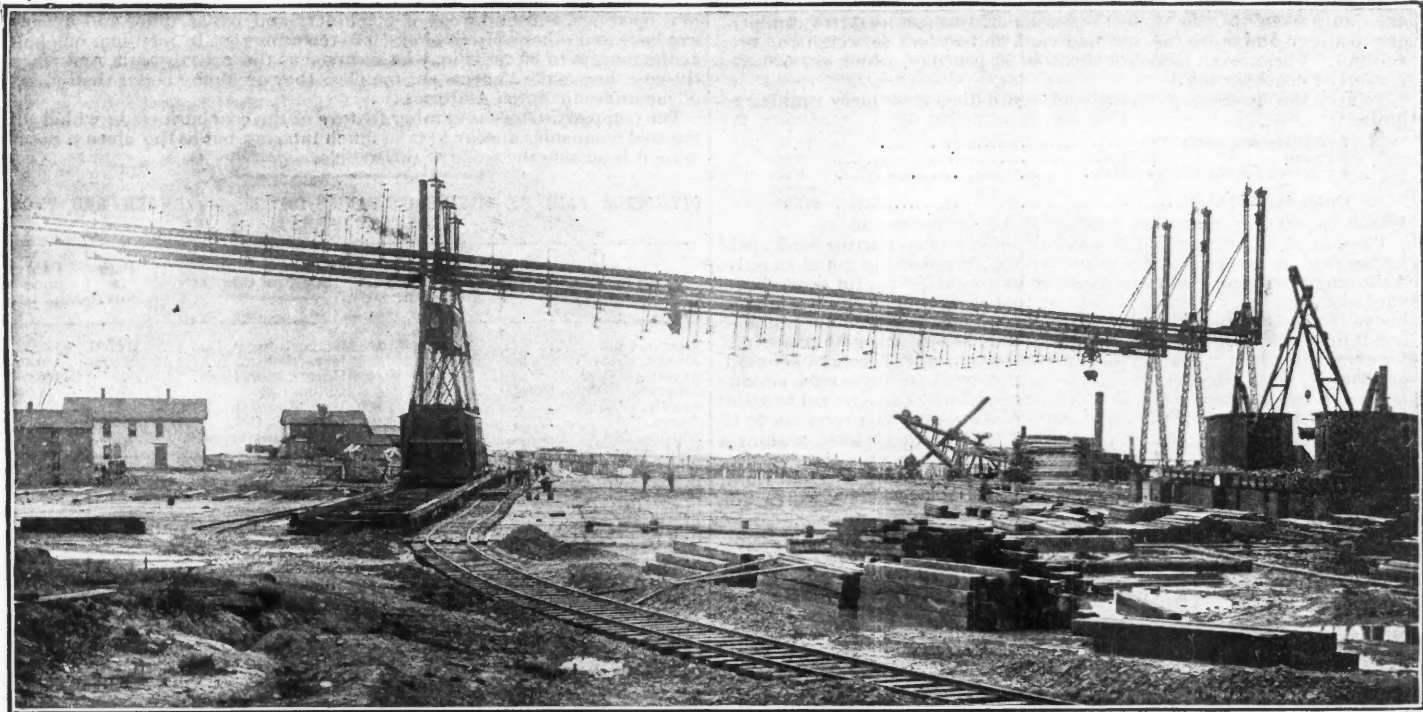
The coal mines and coke ovens of the Mary Lee Coal Company are at Lewisburg, six miles north of the city of Birmingham. The company owns a large and valuable track of coal land on the eastern edge of the Great Warrior coal field, and a railroad five miles long from their property to East Birmingham, where it connects with the different railroads, thus giving outlet to any point in the South.

The present plant consists of a slope mine, 110 coke ovens, a coal washery, locomotive and necessary rolling stock on the railroad, store building, offices and a large number of workmen's houses, forming the mining village of Lewisburg.

The mine consists of a double track slope, driven nearly with the dip of the coal, and is now down a distance of 1,400 ft. from the outcrop to the fourth levels which are now being opened from the slope.

The first and second levels, east and west, have been mined, except the pillars, which are yet available for future mining, and contain with the top coal which is left in the rooms, about 30% of the available coal in the bed, the present output of about 500 tons daily being mostly obtained from the third east and west levels.

The total average thickness of the coal bed is about 6½ ft., divided into several sections or "benches" by bands of bone-coal and slate, one of



NEW DOCK EQUIPMENT AT CONNEAUT, OHIO.

drums, 48 in. diameter, each capable of hoisting 3,000 lbs. at the rate of 300 ft. per minute. The buckets have a capacity of 2,240 lbs. of light ore or about 3,000 lbs. of magnetic or specular ore.

**Quantitative Determination of Lead.**—In the Journal of the German Chemical Society, Dr. Medicus describes his method of quantitatively determining the lead in galena. After converting the lead into chloride he dissolves the chloride in potash-lye and passes a current of carbonic acid through the solution for two hours. The precipitated carbonate is filtered off, washed, dissolved in nitric acid and the lead is then precipitated electrolytically as peroxide. Dr. Medicus also describes his method of precipitating lead from the alkaline solution as peroxide by means of bromine. The chloride is dissolved as before in potash-lye, and the solution is poured into a flask and the neck closed by a cork which has two perforations for the introduction and escape of gas. A slow current of gaseous bromine is then passed through the entrance tube above the liquid, which during the operation is gently heated. The bromine is readily absorbed and the lead is deposited as peroxide. The filtration is best effected by exhaustion through finely divided asbestos between two discs of asbestos paper.

**Interests in the Newly Organized Carnegie Steel Company, Limited.**

—In papers filed for record at Pittsburg recently details of the organization of the Carnegie Steel Company Limited, were made public for the first time. They show that Andrew Carnegie has a controlling interest. Of the original capital of \$5,000,000 in Carnegie Bros. & Company; Andrew Carnegie held \$2,766,666.67; Henry Phipps, Jr., \$550,000; H. C. Frick, \$550,000; George Lauder, \$200,000; W. H. Singer, \$100,000; H. M. Curry, \$100,000; H. M. Borntraeger, \$100,000; J. G. A. Leishman, \$100,000; W. L. Abbott, \$50,000; Otis Child, \$50,000; J. W. Vandervoort, \$40,000; C. L. Strobel, \$33,333.33; F. T. F. Lovejoy, \$33,333.33. Of the capital of \$25,000,000 in the Carnegie Steel Company, Limited, Andrew Carnegie holds \$13,833,333.33. The others run as follows: Henry Phipps, Jr., \$2,750,000; H. C. Frick, \$2,750,000; G. Lauder, \$1,000,000; W. H. Singer, \$500,000; H. M. Curry, \$500,000; H. M. Borntraeger, \$500,000; J. G. A. Leishman, \$500,000; W. L. Abbott, \$300,000; Otis H. Child, \$300,000; J. W. Vandervoort, \$200,000; C. L. Strobel and Secretary Lovejoy, \$166,666.66.

which is from 6 to 9 in. thick. Some of the benches are streaked with impurities and are not of a fine quality. The dip is 13° at the outcrop, which decreases to 7° at the present bottom of the slope, with indications of the field becoming nearly level in advance of the present working, with a slight decrease in the thickness of the bed, and improvement in the quality of the coal.

The general plan of working is by levels, from both sides of the slope, in lifts or at distances of 250 to 300 ft. apart. The rooms or working places are opened about three yards wide from the upper side of the level, and widened out to seven yards, and are separated by pillars four yards broad, the car track is branched into each working place, and the coal loaded in the cars at the face. Five feet in height of the coal is mined, leaving 18 in. of coal for a roof, making a safer top than the loose and jointy clay slate over the coal. The main reason for leaving this large amount of coal, is that it is considered of inferior quality, and mixing it among the coal would damage the sale. The roof in the rooms is secured by a double row of props, 6 in. in diameter, and stood at intervals of 6 ft. The miner at present is paid 42½ cents per ton. The contract includes mining and loading the coal, picking out the bands of slate and refuse, which occur in the coal, securing the roof by propping, the company furnishing and delivering the props where required, laying the car track, and running down the loaded cars to the main entry to be hauled out by mules, five tons being considered the average for a day's work.

The levels or entries are driven 8 ft. wide and 5 ft. high, and when finished, extend to a distance of 3,000 ft. from the slope, east and west. The price paid for entry is 40 cents per ton and \$2 per lineal yard, which includes laying the track. The refuse from the coal in the entry is spread under the track as ballast and the surplus sent to the surface. An airway, for ventilation, is driven on the dip side and parallel to the entry, with a pillar between them 9 ft. broad, with openings through it at intervals of 20 yards. A branch track is run into the airway by slanting down from the main road, in one section of about 300 ft. the air current is by this means carried inward to the entry and returned back through the rooms. An airway on each side and parallel to the slope gives separate return currents from the workings on each side, the west side ventilation being produced by a steam fan, while the east side ventilation is produced by the heat of the steam pipes which convey steam from the boilers on the surface to the pumps at the bottom of the slope, together with the

heat from the exhaust steam passing up the airway to the discharge stack on top.

The haulage inside of the mine, for a business of from 500 to 600 tons per day, is done by seven mules, with a driver to each, to trips of six cars each, carrying 1 1/2 tons, or an average of 75 tons handled an average distance of 2,500 ft. per day by each mule. Much of this time is spent in hauling the empty car singly up to the face of the rooms.

The six empty cars weigh about three tons, and carry a total load of about 7 1/2 tons, or a gross load of 10 tons. With six cars per trip it requires 10 trips per day to haul 75 tons; therefore each mule may be said to travel nearly five miles per day going with the empty car, a load of three tons, and five miles returning with a gross load of about ten tons, a total of 10 miles daily, exclusive of hauling about forty cars singly into rooms, which amounts to nearly one quarter of the work. These figures show what amount of work mules can perform daily, on roads whose condition compares very unfavorably with surface railroads. Assuming wages of drivers at \$1.50 per day,

Seven drivers cost.....	\$10.50
Two men for repairing track, at \$2.....	4.00
Three chainers on bottom of slope, at \$1.50.....	4.50
Seven mules, rated for feed, shoes, harness, etc., at 75c.....	5.25
<b>Total.....</b>	<b>\$24.25</b>

Or estimating 500 tons, daily, is nearly 5 cents per ton for taking the coal from the miner and sending it to the top.

When the cars reach the top of the slope, men are required to handle and dump them over the tippie: one chainer, two runners, two dumpers, one to attend and move the railroad cars, and a clerk to weigh and keep account. These seven men cost about \$9.50 per day, which on 500 tons is nearly 2 cents per ton.

To keep the hoisting, pumping and ventilating machinery running requires:

2 Hoisting engineers @ \$2.....	\$4.00
2 Pump " @ \$1.50.....	3.00
4 Firemen for the boilers @ \$1.50.....	6.00

Or for day and night..... \$13.00

Which on 500 tons is another expense of 2 1/2 cents per ton.

The cost of driving entries, airways or other casual narrow work, paid by the yard, in addition to the price per ton, is not easily got at exactly. Assuming the average distance between entries at 250 ft., for every lineal yard along the entry there is a strip of coal at right angles to it, amounting to 135 cubic yards or tons of coal. By the present system of mining, one-third of the area is left in the pillars, and two-thirds or 90 tons mined for every lineal yard of entry and airway driven, which costs \$3 per yard, or about 3 1/2 cents per ton. When the narrow work for cross-cuts, sinking slope and opening new levels is added, the cost will be increased to about 5 cents per ton. A mine prop and cap costs 5 cents; two rows on 20 ft. and 6 ft. apart is one to 60 sq. ft., or = 11 cubic yards or tons; making a cost of 1/2 cent per ton. After making additions for cross-ties, brattice and other timber used, an allowance of 1 cent per ton will be about right. The coal for steam purposes may be set down at 20 tons, worth \$10, amounting to 2 cents per ton.

The expense of salaries, of mine boss and machinist, oil packing, bolts, nails, ropes and repairs may be set down at \$12.50 per day; 2 1/2 cents per ton.

Adding the different costs together the expense of mining will be as follows:

Mining.....	42 1/2 cents.	Coal for boilers.....	02 cents.
Yard work.....	05 "	Salaries and supplies.....	02 1/2 "
Haulage.....	05 "	Royalty.....	10 "
Tippie.....	02 "		
Timber.....	01 "	<b>Total.....</b>	<b>70c. per ton.</b>

at 500 tons per day, the cost varying inversely as the quantity mined, and is much increased when idle time is taken into account.

The coal from the tippie is dumped upon vibrating screen bars 1 1/2 in. apart; 1/3 of the coal passes over them into the railroad car as lump coal ready for market, the other 2/3 which falls through the bars goes to the washer to be cleaned and crushed for coking.

The Robinson washer has a capacity of 300 tons per day, and consists of a very strong tower of square timber about 30 ft high. The coal is elevated to the top and passes through a revolving screen 2 1/2 ft. diameter and 5 ft. long, with a 1/2 mesh; the very fine which passes through falls into the washer below, while the nut-coal from the screen, goes between a pair of rollers 1/2 inches apart, and passes into the washer the same way; this arrangement is to prevent crowding and blocking the rollers. The washer is a large cone-shaped tank of iron plate, with a vertical revolving shaft in the center, with arms extending to the side of the tank; as the shaft revolves, these arms keep the whole contents of the tank in agitation.

The water is admitted through the side at the bottom of the tank, at the small diameter of the cone, from a pressure pipe, connected to a tank on the top of the tower, the tank being supplied by a pulsometer pump. The large volume of water thus admitted, where the diameter of the cone is small, causes a strong upward current, the velocity decreasing in proportion to the increased diameter of the cone as it ascends, until it passes over the top by an overflow. The partial suspension in water, of the crushed coal, from being stirred around, in an upward current, allows the dirt to settle at the bottom while the coal passes over with the water, the separation being the result of their difference of specific gravity.

The bottom of the cone is extended down, forming a cylinder, with a gate valve at its upper and lower end. When the upper valve is open the dirt settles in it. When full the upper valve is closed and the lower valve opened, the dirt is allowed to fall out into a chute, which carries it off. The valves are worked by hand levers, and act as a "lock," so that the cylinder can be emptied without emptying the cone. The hopper feeds the tank on the inside of an annular ring, bolted to the upper arms, and extending under the surface of the water in the tank; this causes the coal to sink under water before it can escape by the overflow and insures it mixing properly. To allow the dirt to sink, the attendant learns from experience, how often the cylinder requires to be emptied; if the valves are neglected the cone fills up and some will pass over with the coal; if the valves are opened too often coal will get down in the cylinder and be drawn off with the dirt; the time varies with the amount of dirt in the coal, but generally the cylinder has to be emptied every five to

ten minutes; its operation is satisfactory and prepares the coal well for making clean coke. The coal from the washer is elevated into bins, from which the ovens are charged. The ovens, 110 in number, are of the ordinary "Bee Hive" type, and are drawn in 48 hours, or three charges per week.

The expense of crushing and washing is considerable; it requires an engine to drive the machinery and a pump to supply the water, and part of the finely divided coal is carried off with the water as sludge: the machinery and belting cost considerable to keep them in repair and when a breakdown occurs it stops the whole mine. The exact cost of converting the coal into coke can only be obtained by access to the books of the company, but is generally said to be 40 cents per ton of coke produced.

It is claimed that the coal yields 60% of coke; the loss from washing and handling will reduce the yield, and for practical computation of cost, two tons of coal may be allowed for one ton of coke. With coke at \$2 per ton, from two tons of coal at an expense of 40 cents per ton of coke, puts the value of the coal about 80 cents. The company retail their lump coal at the end of their own railroad, a haul of 5 miles, at \$1.50 per ton. Computed on these figures as a basis, the value at the mines is 1/2 at \$1.50 and 2/3 at 80 cents, or a little over one dollar per ton for run of mine, leaving a margin between 70 cents and \$1, or 30 cents per ton in favor of the company.

By the present method there is about 4,000 tons taken out per acre. At 500 tons per day this exhausts an acre in eight days, which depreciates the value of the property. From this and other causes, such as making new openings, tear and wear of machinery and ovens, office and agency expenses and other sources of expense too numerous to mention, one-half of the margin of 30 cents may be assumed as the actual result, and when the company make 15 cents per ton clear they are doing better than many of the mines in North Alabama.

The company's store is another feature of the coal business in which all the coal companies appear to take much interest, but as the store is not a mine it is outside the scope of this article.

**DIVIDENDS PAID BY MINING COMPANIES DURING NOVEMBER AND FROM JANUARY 1ST, 1892.**

NAME OF COMPANY.	Paid in Nov.	Paid since Jan. 1st.	NAME OF COMPANY.	Paid in Nov.	Paid since Jan. 1st.
Adams, Colo.....		\$7,500	Homestake, S. Dak....	\$12,500	\$137,500
Alaska, Tr'dw'll, Alaska	\$75,000	300,000	Hope, Colo.....	25,000	50,000
American Coal, Md.....	90,000	30,000	Horn Silver, Utah.....		150,000
American-Nettie, Colo.....	30,000	20,000	Idaho, Cal.....	7,750	58,900
Argyle, Colo.....	100,000	100,000	Iron Mountain, Mont.....		185,000
Aspen, Colo.....	100,000	100,000	Kennedy, Cal.....		60,000
Aurora, Mich.....	20,000	20,000	Lake Superior, Mich.....		252,000
Bald Butte, Mont.....	6,000	6,000	Leadville Cons., Colo.....		12,000
Bannister, Mont.....	40,000	40,000	Lexington, Colo.....	3,000	33,000
Belden Mica, N. H.....	5,000	5,000	Maid of Erin, Colo.....		139,725
Best Friend, Colo.....	20,000	20,000	Maryland Coal, Md.....		81,000
Bunetallic, Mont.....	40,000	160,000	Maxfield, Utah.....		18,000
Brotherton, Mich.....	40,000	40,000	Minnesota Iron, Minn.....		840,000
Bull Domingo, Colo.....	4,000	4,000	Mollie Gibson, Colo.....	150,000	1,550,000
Bulwer Con., Cal.....	15,000	15,000	Monitor, S. Dak.....		22,500
Buxton, S. Dak.....	20,000	20,000	Morning Star D., Cal.....	7,200	75,600
Calumet & Hecla, Mich.....	1,500,000	1,500,000	Moulton, Mont.....	30,000	30,000
Centennial - Eureka, Utah.....		60,000	Napa, Cal.....		70,000
Champion, Cal.....	3,400	54,400	New Guston, Colo.....		123,750
Colorado Central, Colo.....		55,000	Omaha, Cal.....		7,200
Consolidation Coal, Md.....		205,000	Ontario, Utah.....		750,000
Colorado Fuel.....		67,120	Osceola, Mich.....		100,000
Contention, Ariz.....		50,000	Pacific Coast Borax.....	15,000	165,000
Cook's Peak, Colo.....	10,000	60,000	Pandora, Mont.....		3,000
Copper Queen, Ariz.....		110,000	Parrott, Mont.....		198,000
Coptis.....		15,000	Pharmacist, Colo.....	12,000	24,000
Cortez, Nev.....		95,000	Plumas, Eureka, Cal.....		25,313
Daly, Utah.....	37,500	412,000	Poorman, Ltd., Colo.....		36,450
Deadwood Terra, S. Dak.....		100,000	Quincy, Mich.....		200,000
De Lamar, Idaho.....		272,000	Red Cloud, Idaho.....	10,000	60,000
Dexter, Nev.....		80,000	Rescue, S. N., Mex.....		12,000
Diamond, Kyune & Castle, Utah.....		7,500	Rialto, Colo.....		18,000
Elkhorn, Mont.....		275,000	R'ky Fork Coal, Mont.....		100,000
Enterprise, Colo.....	50,000	400,000	Running Lode, Colo.....		6,000
Eureka Con., Nev.....		12,500	Sierra Butte, Cal.....		36,750
Franklin, Mich.....		160,000	Small Hopes, Colo.....	37,500	37,500
Golden Reward, S. Dak.....	5,000	50,000	Standard, Cal.....		30,000
Granite Mountain, Mont.....		500,000	Tamaack, Mich.....		600,000
Great Western Quick-silver, Cal.....	12,500	125,000	United Verde, Ariz.....		30,000
Hecla Con., Mont.....	15,000	165,000	Utah.....	5,000	10,000
Helena & Frisco, Mont.....		20,000	W. Y. O. D., Cal.....	3,000	3,000
			Yosemite No. 2, Utah.....		5,000
			<b>Total.....</b>	<b>1,045,650</b>	<b>11,426,863</b>

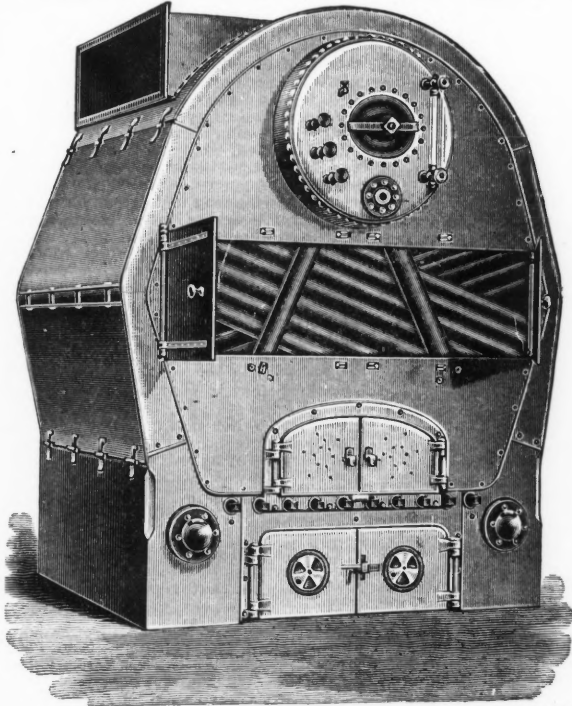
**The Galveston Deep Well.**—An interesting experiment was recently concluded in Galveston, Tex., in the boring of an artesian well over 3,000 ft. in depth. The water supply of the city is furnished by 13 artesian wells, varying in depth from 825 to 1,350 ft., but the water is totally unfit for drinking and domestic use. The city concluded to invest \$75,000 in order to procure a supply of pure water. The well was started with a 22-in. casing. Inside this casing a 15-in. pipe was sunk to a depth of 870 ft., and inside of this a 12-in. pipe was telescoped to a depth of 1,500 ft. Then a 9-in. pipe was telescoped to a depth of 2,363 ft. A 6-in. pipe was then inserted and a depth of 3,070 ft. 9 in. was reached. No water was found nor was any rock penetrated. The contractors have complied with their contract, which was to bore to the depth of 3,000 ft., were paid \$76,000, and further work abandoned. The well is the deepest on the seacoast in the United States, and a description of the different strata pierced by the boring is interesting. From the surface to a depth of 46 ft. there was a stratum of gray sand; thence to a depth of 64 ft. was a layer of red clay and shells; thence to a depth of 100 ft. was a stratum of blue clay, sea shells and fragments of rotten wood. From this to 315 ft. sands and sea shells were encountered, and from that depth to the 815-ft. level sand and clay were discovered. From the 815-ft. level to the depth of 1,288 ft. sand, clay, sea shells and decayed wood were found, and from that depth to the 3,070-ft. level varying strata of sand, clay and large logs were encountered. At the very bottom of the hole a bed of sea shells was struck. The contractors expended \$63,000 before they completed the work.

## A NEW WATER TUBE BOILER.

A new form of high pressure water tube boiler is being placed on the market by the New York Safety Steam Power Company, of this city. The boiler consists of two water and mud drums at the bottom, a steam drum at the top and two series of oppositely inclined tubes, arranged in sets alternately. The water enters the upper drum and goes down the four water legs into the water and mud drums, and then upward through the inclined tubes into the upper drum again. All the tubes and other parts are easily accessible for cleaning and repair. The furnace extends under the entire boiler and is of such a height as to allow of any sort of fuel being used. The steel used is of the best open hearth quality and the boiler is made strong enough to stand 250 lbs. pressure. It can be delivered in sections and a 200-H. P. boiler can be introduced through a 4 ft. by 4 ft. opening.

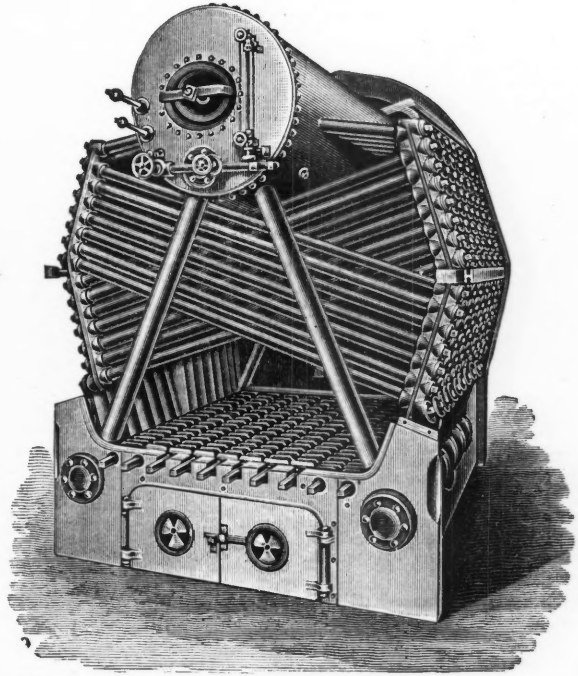
**An New Meteorite**—Mr. Meunier has contributed a paper to the French Academy of Sciences describing a meteorite which fell in the midst of the Sahara Desert, near Hassa-Jekna, on the caravan road between El Golea and Gourara. The analysis gave the following composition: Iron, 91.22%; nickel, 5.88%; cobalt, 0.81%; copper, trace; sulphur, trace; insoluble remainder, 1.04%. The specific gravity at 14°C is 7.67. The meteorite is not large, but presents a rounded contour instead of the usual fragmentary and angular appearance to which we are accustomed.

**High Railway Speed.**—The *Railroad Gazette* vouches for the correctness of the news published in the *Philadelphia Ledger* that on Friday, November 18th, engine 385 of the Central of New Jersey, the Vaucain four-cylinder compound which several months ago made a record of 91 miles an hour, traveled a mile in 37 seconds, and two consecutive miles in 75 seconds, thus beating its own record as well as all others. This was done with a regular train of four cars, going east, between Fanwood, N. J., and Westfield, the grade being 32 ft. per mile, descending. On the



which are driven by engines indicating 2,780 H. P. Coal storage to the extent of 340 tons of coal, which, at mean speed, can carry the vessel 3,000 nautical miles. The maximum speed obtained at the trials was 14.41 knots, under forced draught, and 13.35 knots, with natural draught. This was one knot in excess of the contract. There is an 8-in. compound armor belt along two-thirds the length of each vessel, and extra strong bulkheads are provided. There is an over-all protective deck, a double bottom, with 40 watertight compartments, and two barbettes, with armor from 5 to 8 in. in thickness. The armament of each consists of two Whitehead torpedo ejectors; two 9.37-in. Krupp guns; four Armstrong 4.7-in. quick-firing guns; four 3-pounder Nordenfelt quick-firing guns; two 1-in. three-barrelled Nordenfelt guns. The ships are also provided with electric lights and search lights. Such powerful ironclads, with such light draught, have never before been constructed.

**Emery Wheels.**—It appears from an extensive investigation by Mr. T. Duncan Paret that there is a very wide divergence in the characteristics and work done by various makes of American emery wheels. Under equal conditions the fastest grinder of all will grind cast iron twelve times as fast as the slowest. As a rule, the slowest grinders are the most durable, and the rate of wear of the wheel itself corresponds pretty closely with its abrasive power. It is, of course, possible to make a wheel so pliable that it will wear away directly without having any effect on the iron operated on; but the other extreme, of making the wheel exceedingly durable, is nearly as unprofitable and is much more often seen in practice. Workmen do not like these slow grinders and are apt, in their young and enthusiastic days, to put more pressure on the tool in order to hasten the grinding process. This increased labor is, however, very tiring, and the men soon get tired of it. Many a time they will become so thoroughly tired of the slow grinder that they will purposely injure it in order to be put on a different machine. This increase of pressure often results in a very great increase in efficiency. For instance, if the pressure in a certain well known



A NEW WATER TUBE BOILER.

same trip a distance of five miles was traversed in 3 minutes, 25 seconds, thus making the best record for that distance (87.8 miles an hour). This was between Somerton and Parkland, Pa., on the Reading, which is the same portion of the road where so much fast running has been done heretofore.

**Steel Chimneys.**—The building of a 350-ft. chimney at Chicago, gives us an opportunity to record the previous cases where iron or steel has been substituted for brick or stone in the construction of factory chimneys. The largest which has hitherto been erected in England, is the one of wrought iron at Darwen, Lancashire. It is used for carrying off the gases from the blast furnaces of the Darwen & Mostyn Iron Company. The dimensions and particulars are as follows: Total height, including foundation, 275 ft.; depth of foundation 15 ft.; external diameter at base, 27 ft. 6 in.; external diameter at top, 11 ft.; time occupied in erection of ironwork, 11 weeks; total weight, including foundations and lining, 1,100 tons; total weight of a brick chimney same height and external diameter, 3,000 tons. At Schneider's works at Creusot there is one 280 ft. high, and at the Bekolden paper mills at Kineshnia, Russia, there is one 170 ft. high. There is one 165 ft. high at the Acklam Iron Works, Middlesbrough, England. In this country the largest hitherto built is that at the Cleveland Rolling Mill Company's works at Cleveland, O. It is 213 ft. high. The Pennsylvania Steel Company have no fewer than eight wrought iron chimneys varying in height from 110 ft. to 170 ft.

**New Battleships for Argentine**—Two remarkable ironclads have just been completed for the Argentine Government by Lairds, of Liverpool, England. The problem which was presented to the builders by the Argentine Naval Commission was the construction of two heavily-armed and well-armed battleships, of fairly good speed, of exceptionally light draught, and of the smallest possible displacement. The vessels now completed answer these requirements exactly. Each draws only 13 ft. of water, and displaces 2,300 tons. Propelling power is supplied by twin screws

grinder which usually removes  $\frac{1}{4}$  oz. of cast iron per minute is increased  $2\frac{1}{2}$  times, the output is increased to over 7 oz. per minute. Such a pressure, however, could not be maintained long, and even if it could be it would be very dangerous. The grinder here mentioned is one of the slowest type made, and though very durable is not an efficient machine. There are others in the market which will grind ten times as fast, but their own lives are only from  $\frac{1}{4}$ th to  $\frac{1}{10}$ th of the other. Nevertheless the quicker grinder, other things being equal, must be a more efficient tool. The composition of emery wheels also is a question which is not at all understood. In fact, there are no definite laws or rules about grinders, and every maker has a different theory and idea.

## PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, NOVEMBER 29, 1892.

- 486,877. Boring Apparatus. Otto Lentz, Culm, Germany.  
 486,879, 487,073, 487,074. Magnetic Separator. Thomas J. Lovett, Chicago, Ill. Assignor by mesne assignments to the International Ore Separating Company, New Jersey.  
 487,941. Process of Reducing Titaniferous Iron Ores. August J. Rossi, New York. Assignor of one-half to James MacNaughton, Albany, N. Y.  
 486,891. Hydraulic Mining Engineering Method and Apparatus. Abel M. Rawson, San Francisco, Cal.  
 487,100. Process of and Device for Reducing Volatilized Metals. Chas. E. Seymour, Hurley, Wis.  
 487,167. Eugenol Benzyl Ether and Process of Preparing Same. Fritz Ach, Mannheim, Assignor to C. F. Boehringer & Soehne, Waldhof, near Mannheim, Germany.  
 487,176. Process of Electro Depositing Alloys. Sherard O. Cowper Coles, London, England, Assignor of one-half to the London Metallurgical Company, Limited, same place.  
 487,188. Process of Extracting Metals from Refractory Ore. Henry R. Lewis, London, and Chas. B. Phillips, Chester, England.

## PERSONALS.

Prof. Walter P. Jenney, late of the Missouri Geological Survey, is now visiting Deadwood, S. D.

Col. D. H. Jackson, superintendent of the Holmes mine, at Candelaria, Nev., has gone to Mexico to examine some mining property.

Mr. Ellsworth Daggatt, mining engineer, of Salt Lake City, assisted by Mr. H. F. Wild, of Boise City, Idaho, has been making an examination of the Stoddard mine at DeLamar, Idaho.

Mr. R. C. Chambers, general manager of the Ontario Silver Mining Company, of Park City, Utah, is now in this city on business connected with his company in which he is one of the largest shareholders.

Mr. L. U. Colbath, of Salt Lake City, and A. Schuab, of San Francisco, have been engaged in an examination of the Magnolia mine, at Ferguson, Lincoln County Nevada, on behalf of San Francisco parties.

The Academy of Natural Sciences of Philadelphia, Pa., has awarded the Hayden memorial medal and fund for this year, for the most important contribution to geological and paleontological science, to Prof. Edward Suess, of Vienna.

Dr. Edward D. Peters, the well-known copper metallurgist and author of "Modern Methods of Copper Smelting," has accepted a six months' professional engagement to visit Tasmania, and sails from San Francisco next week. Dr. Peters' address for the present will be care of the Engineering and Mining Journal, New York.

Mr. W. S. Keyes, mining engineer, vice-president of the California State Mining Bureau, has left for Mazatlan, Sinaloa, Mexico, on the 18th inst. to investigate a system of mines near Rosario, Sinaloa. He expects to be absent until February next. Any communications to him in care of the agent of the Pacific Mail S. S. Company, Mazatlan, Mexico, will be forwarded.

Mr. C. E. Palmer has resigned the position of general manager of the Mollie Gibson Mining Company. This was due solely to severe illness, from which he has been suffering for nearly a year. By his physician's advice he has decided to spend a considerable time abroad, and he sailed for Europe on November 16th. The company accepted his resignation with keen regret. Mr. W. J. Cox was elected by the board of directors as superintendent, with full charge of the company's property.

## OBITUARY.

John K. Moton, one of the owners of the Tecumseh (Ga.) Furnace, died suddenly at that place on the 30th ult.

Hugh C. Clark, general Western agent of the Dupont Powder Company, and one of the oldest and wealthiest citizens of Omaha, Neb., died on the 30th ult.

The death is announced of John Naysmith, in Bristol. He was at one time manager of Clee Hills collieries, in Shropshire; was engaged in private engineering practice in America; also was manager of the Ynisecdwyn collieries, in South Wales; of the Bengal collieries, in India; and of the Coalpit Heath collieries, Bristol. He died on September 10th at the age of 50 years.

Thomas C. Hodgkins, of Setauket, L. I., died Thursday, aged 89 years. Mr. Hodgkins was a philanthropist. He had given £20,000 to the Royal Institute of London, \$200,000 to the Smithsonian Institution, \$100,000 to the Society for the Prevention of Cruelty to Children, and an equal sum to the Society for the Prevention of Cruelty to Animals. He came from England at the age of 29. He was poor, but accumulated wealth during the war while in business in this city. He moved to Setauket thirty years ago. He was a widower.

## SOCIETIES.

The sixty-fourth meeting of the American Institute of Mining Engineers will be held at Montreal, Canada, beginning on Tuesday evening, Feb. 21st, 1893. More particular announcements will be made in a later circular. Communications concerning the sessions and proceedings, and papers of notice of papers offered, should be addressed to R. W. Raymond, secretary, correspondence concerning other matters connected with the meeting should be addressed to Mr. B. T. A. Bell, Ottawa, Canada, who represents, until further notice, the local committee.

The fourteenth annual meeting of the Michigan Engineering Society will be held in the Council rooms, in the city of Lansing, Jan. 17th, 18th, 19th, 1893. An attractive programme of papers and discussions is being prepared. Ever since its organization this society has been

advocating and working for better and more economical methods of constructing country roads. The public are becoming, at least to some extent, awakened to the necessity for better roads, and now is a favorable time for action. It is proposed, therefore, to use the second day of the convention for papers and discussions of the road question in its various aspects. Any change in our road laws which will bring about a radical improvement in our country roads, will of necessity open out a wide field of employment for skilled roadmakers, surveyors and engineers.

It is announced that prominent and influential men in shipbuilding and shipping interests of the United States, have completed the preliminary organization of a professional society of high standing to be called the "Society of Naval Architects and Marine Engineers," whose object shall be to promote the art of ship building in all its branches, both commercial and naval. The committee of organization consisting of William H. Webb, of New York; Lewis Nixon, general manager of Cramp's Ship Building Company, of Philadelphia; Col. A. E. Stevens, of Hoboken; Francis T. Bowles, naval constructor of the United States Navy, and Clement A. Griscom, president of the International Navigation Company. They expect to incorporate the society in New York, and are sending out invitations to memberships, hoping to have the first meeting at the time of the naval review next spring. The list of those who have accepted positions in the preliminary organization includes many well known names from all sections of the country. In view of the increasing importance of American ship building interests and the development of the navy, the organization of this society upon a basis similar to that of the civil, mechanical and mining engineers is opportune.

The American Society of Mechanical Engineers has been holding its annual meeting in this city during the latter part of the present week. On Tuesday evening the president, Mr. Charles H. Loring, delivered his address. On Wednesday, Thursday and Friday mornings papers were read and topical discussions took place, and in the afternoons of those days visits were paid to notable works and institutions. The following papers were read and discussed: "Tests on the Triple Expansion Engine at the Massachusetts Institute of Technology," by C. H. Peabody; "An Interesting Boiler Explosion," by F. H. Daniels; "Strains on the Rims of Fly-Band Wheels Produced by Centrifugal Force," by James B. Stanwood; "An Analysis of the Shaft Governor," by F. M. Rites; "A New Process for Cutting Cams," by W. A. Gabriel; "A Simple Difference Engine," by George Richmond; "The Strains in Lathe Beds," by George W. Russell; "Tests of Driving Belts," by S. Webber; "Limit of Propeller Efficiency as Determined by the Surface Form of the Propeller," by W. F. Durand; "Notes of the Refrigerator Process and its Proper Place in Thermodynamics," by George Richmond; "Hydraulic Reaction Motors," and "Negative Specific Heat," by De Volson Wood; "Shall There be an Overhauling of the Right to Use the Title Engineer?" by H. F. J. Porter; "Is the Weaving Shed Design the Best Form of Construction for a Machine Shop?" by John E. Sweet; "To What Extent Can the Milling Machine Replace the Planer?" by W. S. Rogers.

The Scientific Alliance, in its December bulletin, makes the following announcements of meetings:

Academy of Sciences, Hamilton Hall, Columbia College, 8 p. m.—December 5th, business meeting, astronomical section; December 12th, biological section; December 19th, regular meeting; December 21st, public lecture, subject not announced.

Torrey Botanical Club, Hamilton Hall, Columbia College, 8 p. m.—December 13th, regular meeting; December 28th, illustrated lecture on "Hostile Bacteria," by Prof. H. W. Conn, of Wesley University.

Microscopical Society, Mott Memorial Library, 8 p. m.—December 2d, lecture on the history of the society, by President J. D. Hyatt; December 16th, no programme announced.

Linnaean Society, Natural History Museum, 8 p. m.—December 7th, "Notes on Florida," by C. S. Allen, and "Distribution of North American Birds," by F. M. Chapman; December 21st, papers from corresponding members.

Mineralogical Club, Natural History Museum, 8 p. m.—December 14th, inspection of club collection in museum.

Mathematical Society, Hamilton Hall, Columbia College, 3:30 p. m.—December 3d, discussion by J. W. Nicholson.

New York Section of American Chemical Society, Room 29, University Building, Washington Square, 8 p. m.—December 2d, discussion on "Recent Improvements in Laboratory Methods."

The regular meeting of the Civil Engineers' Club of Cleveland, was held November 8th. John G. Oliver and George C. Bardons were elected active members and Charles Orr, an associate member. The paper of the evening was read by Dr. E. W. Morley, Professor of Chemistry, of Adelbert College, on the subject, "Weighing Gases." A brief abstract of which is as follows:

The determination of the atomic weight of oxygen is important in itself, and it has an important bearing on the hypothesis of the unity of matter.

One process for determining this atomic weight consists in determining the ratio of the volumes in which oxygen and hydrogen combine, and then determining also the ratio of the densities of the two gases; twice the product of these two ratios is the atomic weight desired.

The experimental problem is one of considerable difficulty, since the gross weight of the vessel containing the hydrogen weighed is 650 times that of the gas. Since an accuracy of one part in 20,000 in weighing the gas is none too great (though probably impossible), it is obvious that the gross weight ought to be determined (if possible), with an accuracy of one part in 12,000,000.

It is necessary to determine the temperature, pressure, volume and weight, of a portion of the gas in question. In some experiments, the temperature and pressure of the gas were determined at the instant of closing the stop cock of the globe in which the gas was to be weighed. The observation cannot, therefore, be repeated, and great accuracy is therefore difficult to obtain. In experiments now in progress, the temperature and pressure of the gas is not determined, but these are made equal to those of a carefully preserved standard quality of gas, whose temperature and pressure were once for all determined with extraordinary care of many observations. This equality can be repeatedly observed; so that greater accuracy is attainable.

The globes in which the gases are weighed had their volumes determined by a modification of the usual process; the displacement of a globe containing 20 liters could be determined by means of a balance capable of carrying only one litre of water. Eight globes have been provided, and their volumes determined; the use of so many globes reduces the effect of accidental errors of the determination of volume. The volumes of the counterpoises of the globes are made equal to those of the globes themselves within less than one part in 200,000; and the compression on exhaustion which was determined within one part in 1,000,000 was accurately compensated.

The globes with their counterpoises, while in use in an experiment, are enclosed in a desiccator, and not touched; suitable mechanism being provided for effecting necessary manipulations without opening the desiccators. The weighing is effected by the method of reversals. By means of suitable mechanism, the globe and its counterpoise can be hung from each pan of the balance alternately, the observer remaining at a distance throughout the operation. The accuracy attained is satisfactory; the average error in determining the weight of a globe containing 21 litres being one part in 16,000,000.

The results so far attained indicate that the atomic weight in question is 15.88; it is hoped that the experiments now described together with experiments by other methods not here mentioned, will suffice to determine the third decimal place with a good degree of approximation.

## EXPORT NOTES.

The Government of Nicaragua has adopted the metric system of weights and measures. It will be in use in that republic on and after Jan. 1, 1893.

An agreement has been effected between the Governments of Spain and Denmark whereby a minimum tariff is imposed on Danish products imported into Cuba and Porto Rico.

Acting on the reports lately received from the United States Consul at Singapore, that the city contract for gas in that capital expires on January 1st, 1893, and that the Sultan will adopt the electric light, several New England manufacturers of electric light apparatus are bestirring themselves with a view to getting in their bids for the contract, which is expected to amount to something like \$350,000.

The Treasury Department has issued an order for the release of the 16 Belgian glass blowers who have been detained at New York since the 16th ult., on suspicion of being "contract laborers." This action is the result of a careful investigation which disclosed the fact that there is no evidence whatever of a violation of the law in the case of a single one of the men under surveillance. They would have been returned to Belgium but for the intervention of the Belgian Minister.

The Court of Claims on the 28th ult., in the case of the Pacific Mail Steamship Company against the United States, to recover compensation for carrying mails from San Francisco to Australia and the Sandwich and Fiji Islands, the rate of compensation to be equal to the sea postage, decided in favor of the steamship company. The period of which the sea postage is awarded the company extends from October 9th, 1875, to May 26th, 1885. The amount involved in the suit will have to be computed.

According to the report of Treasurer Nebeker, the net revenues of the Government for the fiscal year were \$354,937,784, a decrease of \$37,674,663 as compared with the year before. The net ordinary expenditures were \$354,023,330, a decrease of \$10,349,354. Including the public debt the total receipts for the year were \$736,401,296 and the expenditures, \$684,019,289. The amount of the

public debt is given as \$1,588,464,144. According to the revised estimate, the total stock of money of all kinds in the country on June 30th was \$2,374,334,049, an increase of \$150,000,000 in the year. The issues of United States paper currency during the year amounted to \$376,726,583, exceeding those of any previous year.

A report from Odessa states that there is at present a great scarcity of coal in the meridional governments, and that the prices of the fuel have reached an abnormal height in consequence of the cholera, which has caused a considerable diminution in the output. But 600 miners are at present working in the Donetz pits, compared with 4,000, the usual number; and it is considered probable that an order for 6,000,000 poods of coal, which a large Odessa firm recently placed with a colliery in Southern Russia, may eventually find its way to England, having regard to the delay which the delivery from the native mines would suffer.

Up to May 1st, 1893, the Roumanian State Railway authorities will be open to receive plans for the construction of a new central passenger station and State railway offices in Bucharest. A prize of 100,000 fr. is to be awarded the author of what may be considered the best project; while second and third premiums of respectively 30,000 and 15,000 fr. will be given. Up to January 15th, 1893, schemes may be handed in at the offices of the municipality of Neuchatel for the transmission of water-power from the Reuse at Pre-aux-Clercs to Neuchatel, a distance of 9 kilometers, and its disposal in the town. The first prize is to be 5,000 fr.; the second, 4,000 fr.; and the third, 3,000 fr. Both competitions, we understand, are international.

The transitory commercial arrangement between the United States and the Republic of Salvador, which went into effect December 30th, 1891, has been superseded by a definitive arrangement, the signatures to which were exchanged the 23d of November at Managua, by the Minister of Foreign Affairs, under the authority of the Congress of Salvador, and the representative of the United States. It is believed at the Department of State at Washington, that the definitive arrangement will tend greatly to promote trade between the two countries, and will open a profitable market to numerous products and manufactures of the United States, which have hitherto been hampered by various restrictions.

It is reported that because of a heavy import tax which the French Government threatens to impose upon petroleum after January 1st, 1893, one of the greatest rushes ever seen among the petroleum exporters is now in progress in Philadelphia, Pa. Both steam and sail crafts are being hurried around from neighboring ports in order that the vessels may reach France or clear the Custom House before January 1st next. The supply of tonnage there has not been adequate to the demand, and New York has been called upon to make up the deficiency. The Schuylkill River refineries are working to their fullest capacity to fill the orders for the refined product, while carriers which have never been here before have been engaged to deliver the crude product before the end of the year.

In a report published by the State Department Consul Freret, of Piedras Negras says: Every business man seeking trade in Mexico should procure a copy of the Mexican tariff and make a thorough study of the requirements of the law. Customs duties are specific, and with few exceptions all importations pay duty by weight. Weights are divided into three classes, viz., gross, net and legal. The first two need no explanation, but the legal weight is especially a feature of the Mexican tariff, and is the weight of the article, with that of the bottle, pasteboard, wooden or tin box or whatever serves as a wrapper or holder of the article in its ultimate or smallest packing, and not including the weight of the outer larger box, case or package in which the smaller packages are contained, or the straw, excelsior or paper shavings used to prevent injury in transportation. As the bulk of importations pay upon weight, and mostly upon gross or legal weights, it will be readily seen how great is the importance of using a kind of packing as light as is consistent with safety in transportation. The rules for preparing consular invoices and manifests are very strict and should be carefully studied. Any omission or error, even clerical, imposes the liability of a fine. As a rule, Mexican merchants when ordering goods are very particular in their directions how goods should be packed, labeled, marked, etc.

#### INDUSTRIAL NOTES

The Linden Place Oil Company has been incorporated at Covington, Ky., with a capital stock of \$100,000. The incorporators are C. A. & R. Walker, Louis Fritsche and T. Heinemann. It is proposed to prospect and develop oil and gas lands.

The Pine Mountain Iron and Coal Company, of Pineville, Ky., has made an assignment and its affairs are in the hands of the Germania Safety Vault and Trust Company. It is stated that the Company is perfectly solvent and wishes to retire from business.

The London "Daily Telegram" announces that the Cynon Tin Plate Works have resumed, after a suspension of three months. There has been a general resumption in the Swansea, Moreyston and Llanelly districts, resulting from extensive American orders.

The strikers at the Carnegie mills at Pittsburgh, Pa., decided on the 26th ult. to continue the strike until their organization is recognized, notwithstanding the collapse of the strikes at Beaver Falls, Homestead and Duquesne. The vote for continuing the strike was 120, against 43.

The Gauley Company, of Camden, W. Va., has been incorporated with a capital stock of \$1,000,000. The incorporators are William Armstrong, of Belpre, O.; M. & H. P. Camden, J. B. McCoy and H. H. Moss, of Parkersburg. It is proposed to own and operate coal mines, lumber mills, etc.

Charles W. Haskins, president of the Augusta Mining and Investment Company, of Cedartown, Georgia, has been appointed permanent receiver of this company. It is estimated that the assets, including mining properties in Virginia, Georgia and Alabama, will amount to about \$1,000,000.

Deeds conveying the large gunpowder works plant, covering 300 acres, at Keokuk, Ia., from Henry R. Dupont, attorney-at-law, Wilmington, Del., to Eugene Fraucis, Henry A. Alexis, Charles and Alfred Dupont, F. I. Dupont, De Nemours & Company, were filed with the county recorder on the 26th ult.

The books of subscription for the \$500,000 8% preferred stock of the Stillwell-Bierce & Smith-Vaile Company, were opened at the offices of Henry Clews & Company on the 26th ult., and were to have been kept open until the 29th. The entire amount was subscribed and applied for three times over on the first day.

The heaters in the 112-in. plate mill of the Pottstown Iron Company, at Pottstown, Pa., were notified on the 29th ult. that hereafter one heater would be required to run two furnaces and the remaining heaters would assume the place of the helpers. In consequence of this order the men refused to work and the mill is closed down temporarily.

The application for work at the Carnegie Steel Company's shops at Homestead, Pa., by the old men continues and the weeding-out process at the mill shows no signs of abatement. Nearly 200 non-unionists left the works on the 28th ult., and their places were filled by the Amalgamated men. A large percentage of the old men have returned to their old situations or have received work in other departments of the big steel plant.

The Spathic Iron Company, of Florence, Ala., has been organized with Thomas Sharp, president, and H. W. Buttorff, secretary and treasurer. The directors are, H. W. Buttorff, J. L. Gaines and Thomas Sharp, of Nashville, Tenn.; F. B. Nichol, of Bessemer, Ala., and Oscar Marchuetz, of Louisville, Ky. The company has leased the North Alabama Furnace, at Florence, which it will repair and put into blast at an early date. Ore banks at Iron City, Tenn., will be developed for the ore supply.

The Congdon Brake Shoe Company of Chicago, for several years have worked an iron foundry in that city for the purpose of manufacturing their brake shoes and other castings used on railroads. Though the greater part of the brake shoes are made of east iron, small pieces of high class steel are embedded in them for tire dressing purposes. In order to meet their own demand for this high quality of steel the company determined a short time ago to erect a steel plant of their own. This extension of their works is now complete, and in addition to being able to make steel for themselves the company are in a position to supply the best qualities of steel to other consumers. The new plant and the buildings and appurtenances generally have been designed on modern principles. The plant consists of a 15-ton Siemens-Martin furnace and four 6-pot crucible steel melting holes. Two Siemens regenerative gas furnaces supply heat to the open-hearth furnace and another heats the crucible furnaces. Nearly the whole of the power is furnished by electricity generated by C & C motors and a Russell steam engine. Electricity is also used in supplying light to the shops. In the molding room there is a 15-ton Shaw electric crane as well as two hand cranes. Throughout the building there is a tramway system on which run Hunt narrow gauge cars drawn by a light locomotive. Very little hand labor is used at all as all the operations from charging the gas furnaces to moving the castings are done by power. In the iron foundry also electric light and electric cranes are used. The steam engine and the drying ovens and annealers are all heated by oil fuel and the Siemens producers are fed with Youghiogheny coal. The steel plant has been erected under the direct supervision of Mr. J. A. Herrick, of this city, and every detail both of design and material has been attended to most carefully in order that the best results shall be obtained.

#### MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting machinery or supplies of any kind will notify the Engineering and Mining Journal of what he needs, his "Want" will be published in this column, and his address will be furnished to any one desiring to supply him.

Any one wishing to communicate with the parties whose wants are given in this column can obtain their address at this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, thus enabling the purchaser to select the most suitable articles before ordering.

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

#### Goods Wanted at Home.

2,835. 165 tons of good steel T-rails, with angle splice bars. Virginia.

2,836. 50 mine cars (2 ft. gauge). Virginia.

2,837. A pair of hoisting drums, 10 ft. diameter, with engine. State age of machine, name of maker, probable weight, and price f. o. b. cars. Michigan.

2,838. 6, 8 and 12-lb. T-iron rails with spikes, switches, frogs, etc. Virginia.

2,839. Machinery for making coiled hoops. Michigan.

#### Goods Wanted Abroad.

2,840. A good luminous paint that will show in darkness. Australia.

#### Goods Wanted at Home.

2,841. Apparatus for loading mine cars in gondolas by machinery. Ohio.

#### GENERAL MINING NEWS.

##### ALABAMA.

##### Cherokee County.

(From our Special Correspondent.)

The bauxite banks owned by the Bass Furnace Company in the Dike's district, are still being worked regularly. A new bank known as the "Washer" has been recently opened. An open cut now being run into the hill containing the mineral, shows a solid body of bauxite 75 ft. in width and about 30 ft. in height at the face, of remarkably fine quality. This bank differs in formation from any other which have been opened in this district, for instead of being a pocket deposit with no clearly defined walls as has hertofore been found to be the case; here the formation has a regular dip of about 40°, with a clearly defined hanging wall on the southwest side of the vein or ledge which has been exposed in running the open cut, but although a width of 75 ft. has been shown of solid bauxite, yet no foot wall has been encountered. The floor of the cut is still in bauxite and, from the regularity of the dip and the increasing value of the ore as depth was attained, the assumption of this proving to be a true vein and continuing down a great depth is warrantable, although no sinking has been done to prove this theory. Hertofore in all workings in this district, no such formation has been encountered in mining for bauxite, and the general belief was that the mineral was only found in pocket deposits, with no indications to warrant the assumption that it would continue down for any great depth; but in all the banks worked it has been to continue down about 30 ft. no work to ascertain actual depth of the ore body has been performed.

Bass Furnace Company's charcoal furnace which has been undergoing repairs and enlargement, will go in blast about December 1st.

##### CALIFORNIA.

(From our Special Correspondent.)

The Anti-Debris Association has been in session at Sacramento this week, Sacramento, Yola, Colusa, Yuba, Sutter and Glenn counties being represented. Resolutions were adopted declaring the Association intends to fight hydraulic mining to the bitter end, but although the resolution was strongly worded, it was developed during debate that the Anti-Debris people do not oppose hydraulic mining as an industry, but only when calculated to injure them. The Caminetti bill was not discussed but the members are generally in its favor if its various provisions are carried out. The Association adjourned until the first Monday in December.

##### Los Angeles County.

(From our Special Correspondent.)

Southern California Smelting and Repairing Works, Los Angeles.—Two months ago this new corporation obtained 17 acres of land which it has been engaged in cleaning preparatory to the erection of a 60-ton smelter along side the river. The City Council had granted the right to use water from the river and it seemed as if the city was about to have another profitable industry established in its midst. Opposition has been aroused, however and the Mayor, it is understood, intends

to veto the contract with the company on the ground that smelting works within the city limits are not to be desired. The Mayor alleges that it has been proven at Butte, Mont., and Leadville, Colo., that the smoke and fumes from smelters are destructive to animal and vegetable life; and he believes, furthermore, that in time the river will be poisoned. Los Angeles, being a city of beautiful homes, does not desire any such industry established.

#### Mono County.

**Bulwer Consolidated Mining Company.**—The latest official weekly letter says: "Upraise from crosscut 2 south was extended 7 ft.; there are 2 to 5 in. of ore in face that will average \$40 per ton. Crosscut 3 north 200 level, was extended 8 ft. South drift from east crosscut 3 north drift 100 level, was extended 7 ft."

**Standard Consolidated Mining Company.**—The Bodie "Miner" says: "Work on this company's electric plant has been completed, with the exception of putting in the dynamos. These will be shipped soon, and it is expected that within a month the mill will be run by electricity. Electricity will be furnished not only for running the mill, but also for lighting purposes. Superintendent Leggett canvassed the town last week and the business men signified their willingness to use electricity for lighting instead of oil. The telephone from the mill to the plant has been completed and is now in complete working order."

#### Nevada County.

**Champion Mining Company.**—This company of Nevada City has declared a dividend of 50 cts. a share. The company has been paying monthly dividends of 10 cts. per share for some time. The last dividend, says the Nevada City "Transcript," is the more notable when it is known that last month the company expended \$17,000 in doubling the capacity of its 15 stamp mill and making other permanent improvements. This month it is constructing the heaviest hoisting and pumping rig in the district, and the plant that this is to displace is to be removed to the Merrifield mine (recently acquired by purchase), which is to be reopened this winter by the Champion company.

#### Shasta County.

**Gladstone.**—This mine has been shut down for an indefinite period, says the Redding "Free Press." It is rumored that the ore does not pay well enough. Some 70 miners and mill men are out of employment.

**Reid Mines Consolidated Company.**—This company, of Old Diggings, according to the Redding "Free Press," which has been sinking on the old Spanish shaft, in a distance of 15 ft., has come upon the ledge reported to be rich in sulphurets. This shaft paid well on the surface, but the ledge petered out in a distance of 30 ft. Now it has come in again. The shaft is being sunk jointly with the Joshua Hendy company, and will be extended down 500 ft. and used as a main shaft through which to work the mines.

#### Siskiyou County.

The placer mines on Cherry Creek, will, it is reported, be ground-sluiced on an extensive scale as soon as the snow and rain storms come to furnish water. They are dry diggings except during winter and spring.

Mr. James E. Ironsides has just cleaned up a crushing of several tons of quartz at his Cherry Creek ledge on the divide between Yreka and McAdams Creek, realizing about \$20 to the ton, the quartz being only such as taken out while doing the dead work in sinking shaft and tunneling.

#### COLORADO.

##### Boulder County.

It is reported from Louisville that a syndicate of Pennsylvania people has been buying up the choicest coal lands in that vicinity, and Mr. Robert Wilson is to develop it. The coal lands of John Simpson and J. W. Jacobs have been bought and paid for, and options are held on other tracts.

##### Clear Creek County.

**Edgar Union Mining Company.**—According to the Idaho Springs "News," this company recently ran into a 4-in. streak of smelting ore that assays three-tenths of an oz. in gold, 31 oz. silver and 32% copper; the streak is widening as the drift goes west.

##### El Paso County.

Advices from Cripple Creek report that the iron-work for the stamp mill and sampling works, which the French syndicate is preparing to erect in Squaw gulch, has been ordered, and the work of excavating for the foundations of the buildings was started on the 22d ult. (See Engineering and Mining Journal of Nov. 26th.)

##### Gunnison County.

**Ruby King Mining Company.**—The Crested Butte "Pilot" publishes the following: "The Ruby King mine, at Irwin, has shut down, and for the reason, we believe, that the stock has not been sold rapidly enough to provide capital to carry on the work. The development is costing more than the company anticipated. It is a stock company, working the property under bond and lease, and if these should expire on account of the company not taking it up, the stockholders will be the losers. The bonded price, something like \$80,000, was

too high, to start with, according to our idea of mining property values, and now that a considerable amount of work has been done, the company is indignant to think that it might have been done to a better advantage."

#### Ouray County.

The following are the latest items of mining news from Ouray, taken from our exchanges: The Guston still continues to keep up its record by shipping out from 6 to 8 carloads of premium silver ore each day. One hundred tons of coal went up to the Sweepstakes mine on the 24th ult., by which it may be judged that work will progress there this winter. A contract has been let to sink 100 ft. on the Cora Belle shaft, and a diamond drill is to be put to work at the third level. Indications point to a handsome ore body below the present workings. Excellent pay mineral has been struck in the new working tunnel of the United States Depository. The mill will start up before the end of this month. The Carbonate King shaft is now down to the fifth level, 385 ft., and a crosscut is being run; also drift from the fourth level to connect with the Carbonate Queen. A 10-in. streak of ore averaging 90 oz. silver and 40% lead has been run into in the 200-ft. level of the American Girl. A diamond drill is at work on the 300-ft. level and several good ore bodies are in sight. Shipments continue regular. American Nettie, Virginias, Humboldt and all the old-time producers are shipping gold and silver every day. The upper country mines are all likewise hard at work, and every indication now points to a prosperous winter season for Ouray.

#### Pitkin County.

**Hardinge Smelting Company.**—This company has been incorporated under the laws of Colorado. The officers are as follows: W. H. Hardinge, president and manager, Aspen, Colo.; H. D. Selleck, vice-president, Buffalo; E. N. White, secretary and treasurer, Aspen. The directors comprise the above-named gentlemen and H. F. Selleck, Denver, and Geo. P. Polts, of New York. The plant is located at Aspen, and has two furnaces, having a capacity of from 60 to 80 tons per day, says the Philadelphia "Investor." The Hardinge people claim to be treating from 50 to 60 tons of ore per day, netting \$200 profit per day. The company is capitalized at 100,000 shares, \$5 each. The plant is stated to have cost about \$215,000 and that the liabilities of the company do not exceed \$20,000. A meeting of the stockholders was held at Chicago, November 17th.

#### FLORIDA.

##### Polk County.

(From our Special Correspondent.)

**The Excelsior Phosphate Company, Bartow.**—This company is making many improvements in its plant for mining and handling phosphates. Conspicuous among them is a large rotary dryer 8 ft. in diameter and 35 ft. long, also a huge dredge supplied with a powerful force pump for disintegrating the pebble and a 10-in. centrifugal pump for delivering it to the lighters. A canal is being cut for floating the lighters from the dredge at work on Peace River to the new dryer, and storage bins to be erected on the South Florida Railroad about a mile and a half above Bartow.

#### GEORGIA.

##### Carroll County.

(From our Special Correspondent.)

**Bonner Gold Mines.**—This property comprises a tract of 1,150 acres situated in the western part of the county near the Alabama State line. The formation is an exceedingly interesting one and worth a detailed description; but to be brief, it consists of many small and very rich veins throughout the tract, the surface of which is honeycombed with old workings. The former owner, Judge Zador Bonner, was a very energetic man and worked a large force of slaves before the war with considerable profit, which has given the mines quite a reputation; in later years they attracted considerable attention from capitalists, and would probably have been operated on a larger scale had the owner been a younger man. At his death in 1890 he willed the property to his son, G. A. Bonner, which resulted in a lawsuit, one of the daughters filing an objection to the probate of the will. It was admitted to probate, however, and the case is now being taken up in the Carroll County Court. The property is held at \$200,000 and a straggle fight will be made by each party.

##### Fulton County.

(From our Special Correspondent.)

**Georgia Pyrites Mining Company.**—This company is developing its pyrites mine near Ben Hill; a mining plant has been erected and is in operation. There is an excellent market for pyrites, free from arsenic and carrying from 40% sulphur upward, especially lump ore.

#### IDAHO.

##### Alturas County.

The North Star concentrating works, which have been idle for months, was started up on ore about a month ago, and has run daily ever since. It will also re-work the tailings in order to recover metals which they contain.

The rumor that the smelting works at Ketchum were to resume operations at an early day, seems to be based on fact. Only one stack, hav-

ing a daily capacity of 30 tons of ore, will be "blown in." It will begin its campaign as soon as 1,000 tons of ore and the coke and other principal supplies necessary to reduce them, are on hand. The ore will come from the North Star and American Eagle group of mines, on the East Fork of Wood River. The North Star concentrating works, which have been idle for months, was started up on ore about a month ago, and has run daily ever since. It will also re-work the tailings in order to recover metals which they contain.

#### Boise County.

**Boise County Mining Company.**—The stockholders of the Boise County Mining Company held their annual meeting on the 15th ult. Business of considerable importance was transacted. S. C. Silsby, M. H. Kempner, H. W. Duntou, J. B. Stewart, M. G. Luney, F. V. Tinker and H. P. Pomeroy were elected trustees for the next year. This is the company that is sinking through the false bedrock for the purpose of ascertaining whether there is pay gravel underneath it. Already \$4,000 have been spent in the work of putting down the shaft, which has reached the depth of 115 ft. The stock was increased from 12,000 to 100,000 shares and the trustees were authorized to sell 40,000 shares at 25 cts. per share for the purpose of raising a working capital. When the company was incorporated the original owners of stock took half of it at 25 cts. per share and placed the remaining 3,000 on the market at 50 cts. per share, and they were all sold. The most of the stock of the second issue was taken by Banner men, who became dissatisfied because they were not given the same privileges as the original stockholders, and asked, through their representatives, an equalization of stock, which was done by a unanimous vote of the stockholders.

#### Shoshone County.

(From our Special Correspondent.)

**Gem.**—This property is probably sold by this time as negotiations have been underway for some time past with New York and London capitalists, and experts have examined and reported favorably on this property. Mr. John L. Finch is now in New York ready to make a delivery of stock of the present company. The local stockholders, consisting of A. B. Campbell, of Wallace, Mr. Gross, of Mullan, Captain Sanborn, of Coeur d'Alene, and Hon. John L. Wilson, of Spokane, have decided their stock to Mr. Finch as trustee, and Mr. Finch also secured the same from the stockholders at Milwaukee, Wis., and Youngstown, O., on his way to New York. One million dollars is the sum said to be paid for this property. But for the labor troubles last spring in the Coeur d'Alene, this property no doubt would have changed hands sooner, as negotiations were underway with that object in view, but fell through on account of the recent troubles.

**Morning.**—Since the purchase of this property last spring by the Milwaukee Syndicate, extensive improvements have been made in the machinery for convenience and economy in concentrating their ore, as well as additional and more economical facilities for transporting same, and still more improvements than those already made are in contemplation. One section of their mill is completed and in operation, and it is considered one of the most complete concentrating plants in the Coeur d'Alene. A mile above Mullan the water of Boulder Creek is diverted from the main channel and carried by means of a flume along the mountain until it attains a height of 1,000 ft. above the mill, from which point it falls through 3,700 ft. of iron pipe to two 6-ft. and one 3-ft. Pelton wheels so arranged that the 3-ft. wheel will run the gates and the 6-ft. wheels will run a section of the mill. The machinery consists of four Gates crushers, four sets of Cornish rolls, 32 figs, 4 double disk tables and 8 vanners. The machinery is so arranged as to work the middlings. Separate from the other ores, are middling figs.

**Mother Lode, Murray.**—This gold mine is one of the most prosperous as well as one of the most fortunate in the country. The owners struck a rich pocket last week from which they took out over \$3,500 in six days. This is not the first time they have been so fortunate to strike these rich pockets. They have three veins on their property, all carrying free gold.

**Rapid River Mining Company.**—This company has made preparations to work their properties all winter. Their ledge is 4 ft. in width and the ore is free milling, assaying \$90 to the ton. A wagon road is being constructed from Union and it is expected to be completed in time for their machinery, which consists of a 10-stamp mill, which has been purchased and will soon be shipped. It is calculated that sufficient ore will be taken from their tunnel on the Alliance, to keep their mill in full operation.

**Tin Cup, Osborn.**—This property is located in the dry ore belt of this district and recent developments proves the ore to be high-grade and to possess good fluxing qualities. They have a 450-ft. tunnel and have reached a depth of 250 ft. on the ore shoot. The ore is high-grade gray copper, clean and very free from gangue. They claim the gangue carries 30% excess of iron to the whole output and is a valuable iron flux. The property is owned by J. L. Montgomery, W. E. Mann, of New York, and Chas. Wing.

## KANSAS.

## Cherokee County.

During the week ending Nov. 26th, the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 2,920,490; rough ore, pounds sold, 2,245,830; zinc ore, pounds sold, 1,044,890; lead ore, pounds sold, 200,680. Sales aggregated a total value of \$14,849.

## MICHIGAN.

## Copper.

Knowlton Mining Company.—At the special meeting of the stockholders of the Knowlton Mining Company it was decided not to reorganize the company at the expiration of the charter, but to wind up the affairs of the company and sell the real and personal property. A change of management also took place, and in place of F. W. Capen, who, for upwards of twenty years has acted as secretary and treasurer, Mr. W. Hart Smith was elected to the office, and the office of the company transferred to 52 Broadway, New York, the office of the Quincy Mining Company.

## Iron.

The first shipment of iron ore from Mesaba range arrived at Cleveland in the whaleback barge 102, on the 25th November. The cargo consisted of 2,073 gross tons of ore from the Mountain Iron mine, and was loaded at the new Duluth and Iron Range docks at West Superior, early in the month. Only one other cargo of Mesaba ore has been shipped this season. That is on the barge 117, which is now detained at Duluth by inclement weather. That cargo is assigned to Fairport. It is expected that 200,000 tons will be shipped from the Mesaba region next season.

## Iron—Marquette Range.

A few weeks ago an option was taken on a piece of land on Section 6 by a number of Ishpeming gentlemen, and the "Section Six Exploring Pool" was formed. Active exploratory work has been in progress since. The land lies in the vicinity of the St. Lawrence mine, a short distance west of which hard ore was found within a few inches of the surface. A short distance further west a shaft has been sunk, and in this soft ore was encountered 10 ft. from surface. The shaft is down 30 ft., 20 ft. of which is in good ore. As the shaft continues in depth the ore makes a better showing, both in quantity and quality. Continuing west, the vein has been traced several hundred feet. The vein appears to be a continuation of the one on which the St. Lawrence mine is situated.

Winthrop Iron Company.—This company is sinking its new Mitchell shaft for another level, the 480-ft. This property is reported to be promising well. The south side Winthrop is not showing as well in good quality ore as it did some months ago. There are large deposits of low grade material running about 50% in iron, but too poor to market.

(From our Special Correspondent.)

Great difficulty is experienced in unwatering Lake Angeline. Forty feet of decomposed vegetable matter, is sadly interfering with the arrangement of machinery and choking up the suction. The lake is after all merely a pond of surface water collected from a large area and having no other inlet. The peculiarity of the topography accounting for the vast quantity of silt at the bottom. Already the reclaimed land is being used; a large mine "dry" house now going up where the water recently stood. The shaft, known as the Lake Superior Hematite Lake shaft upon its bank, is now closed down till spring. All the other shafts around the shore are working full force. A deal is under way whereby the East New York, Iron Center and Sagman properties will consolidate and be vigorously worked. Local capital with the help of some from "below" entering into the scheme. This season the output of the Winthrop is the largest in its history. A new district known as the South Winthrop, is being opened up under bright indications. The old Winthrop lies against a diorite bluff and dips north. The South Winthrop lies against the same bluff, but is on the other side and of course will dip south.

Lake shipments will continue till the Sault Canal freezes. On Section 21 sinking has again commenced.

## MISSOURI.

## Jasper County.

Joplin, Nov. 28.

(From our Special Correspondent.)

The output of ore from the lead and zinc mines was fully up to the average last week, but the shipments were light on account of the scarcity of cars. The price of zinc ore remained firm at an average of \$23 per thousand. Lead ore is on the decline; the market opened at \$20 per thousand and closed Saturday at \$19.

Following are the sales from the different camps as far as reported: Joplin mines, 1,502,830 lbs. zinc ore and 262,020 lbs. lead; value, \$22,147. Webb City mines, 559,820 lbs. zinc ore and 29,440 lbs. lead; value, \$6,884. Carterville mines, 1,524,000 lbs. zinc ore and 149,260 lbs. lead; value, \$20,131. Zincite mines, 30,060 lbs. zinc ore and 3,550 lbs. lead; value, \$439. Lehigh mines, 77,140 lbs. zinc ore; value, \$887. Oronogo mines, 48,160 lbs. lead; value, \$963. Aiba mines, 108,080 lbs. zinc ore; value, \$1,115. Carthage mines, 32,860 lbs. zinc ore; value, \$360. Galena, Kan., mines, 1,044,890

lbs. zinc ore and 200,680 lbs. lead; value, \$14,849. District's total value, \$67,775.

There is a large amount of ore on hand in the bins at the mines, part of which is sold, but could not be shipped on account of the scarcity of cars. The past week has shown a marked activity in the mines through the entire district. A large party of capitalists came in from Indianapolis who are interested in some new development 8 miles south of Joplin, in Newton County. This company spent all spring and summer in prospecting and developing on what is known as the Walker land, On Burkhardt prairie they are reported to have opened a good deposit of silicate and zinc blende and have just completed a good concentrating plant at a cost of \$10,000. Granby, Newton County, Mo.—The Journal correspondent had the pleasure of visiting this the oldest mining camp in southwest Missouri. Lead mining has been carried on here almost continuously for the past 45 years by the Granby Mining and Smelting Company. Up to within a few years the mines were confined to rather a small area, but recent developments to the south and southeast have opened up wonderful deposits of shallow lead deposits, and deep prospecting by drilling has found the zinc ore. Mr. John Kingston, the superintendent of the company, informs us that the Granby district has had a very prosperous year. The company operates its own lead smelter, which has been run to its full capacity during the entire year.

## MINNESOTA.

## Iron—Mesaba Range.

A Cleveland iron ore syndicate has purchased from the Great Western Mining Company, of Duluth, a 40-acre tract of iron lands on the Mesaba range for \$300,000 cash, it is stated. The ore deposit on this tract covers, as so far determined, 10 acres.

The West Duluth Blast Furnace Company signed a contract recently with the Biwabik, the Standard Ore Company and the Mountain Ore Company for from 75,000 to 100,000 tons of Bessemer ore for the winter supply of the blast furnace. The furnace, which has hitherto used Gogebie ore almost exclusively, is now being cleaned out and will be ready for work in about 30 days.

## MONTANA.

## Deer Lodge County.

Champion Mining Company.—It is reported that the Champion mine will be closed down and the work of driving a tunnel to the 800-ft. level begun at once.

Southern Cross Mining Company.—Shipment of ore will commence at once. The mine has been idle for several months.

## Lewis and Clarke County.

Montana Company, Limited.—The following circular has been issued to the shareholders by the secretary:

"In forwarding you the accompanying notice of meeting, to consider a scheme of re-construction, I am instructed by my directors to state the since the recent return of Mr. R. T. Bayliss from the mine the directors have devoted much consideration to the present and future prospects of the undertaking and to the financial difficulties of the company; these have been aggravated by the "attachment" recently placed upon the property by the St. Louis Mining and Milling Company, with which the Montana Company is in litigation. After due and careful deliberation, the directors have arrived at the conclusion that re-construction has become absolutely necessary, for the following reasons:

"1. The mine requires and is worthy of rapid development if successful results are ever to be attained. For this development, without reconstruction, no funds are available.

"2. A stock of stores, such as fuel, quicksilver, etc., etc., must be carried at the mine, amounting to from £12,000 to £15,000. Owing to the interruption of the operations during the past six months, and the direct and indirect loss caused by the fire and flood of last spring, the company has for some few months past been dependent upon the bankers in Helena for the necessary advances to carry this stock of stores. Owing to the action of the plaintiffs in the St. Louis lawsuit, covering the whole of the company's real estate by an attachment, the bankers have requested the company to pay off their loan of £15,000. This can be done only by raising fresh capital.

"3. In order to fight the lawsuit to an issue about £6,000 will be required to pay legal experts, witnesses, etc., at the conclusion of the trial. Without reconstruction this money cannot be found; and unless it is provided, the case would be undefended and go against the company by default, in which event there could be no appeal, the company's valuable property, machinery, stocks of tailings and of stores, would become the property of the adversary and the company would be ruined.

"Two methods of raising the required new capital presented themselves—the one by issuing debentures, the other by a reconstruction of the company. After consultation with some of the largest shareholders at which both proposals received careful consideration, the issue of debentures was rejected by the majority, and reconstruction was considered the best policy, as under it every shareholder would be placed upon the same footing, if he desired to retain his existing interest in the

company. Reconstruction involves the formation of a new company, in which each shareholder in the Montana Company, Limited, will be entitled to one share for every share he now holds. These shares will be issued at 17s. 6d. paid, and carrying a liability of 2s. 6d. per share. It is not intended that more than 1s. per share (payable 6d. on application and 6d. on allotment) will be called up by the directors of the new company until the result of the action of the St. Louis company is ascertained. Further calls will be made only if and when required. Considering the past history the present value and the future prospects of the mine, the value of the machinery, mills, stores and tailings, the directors deem it to be the true interests of the shareholders to heartily support the scheme of reconstruction, and they invite all shareholders to send them their proxies."

## Silver Bow County.

Anaconda Mining Company.—At the Wake-up-Jim and Green Mountain sinking is in progress from the 600 to the 1,000-ft. level, which, when finished, will give 400 ft. of new ground at each mine.

At the Buffalo the new shaft has reached a depth of 300 ft., the station at this point having been finished.

The shafts of the High Ore and Mountain Consolidated will also be sunk to the 1,000, which will give the company 300 ft. of new ground in these claims, each now being at the 700. Sinking will be commenced immediately after the shaft is timbered.

Kitty Morris.—This mine has been closed down. It is understood that the shut down was occasioned by poor results. The mine has been worked for about a year, during which time the shaft has been sunk almost 300 ft. For a time the mine promised to be a great producer, but the ore encountered was in streaks, which, although assaying high, soon petered out. Messrs. Olds & Company, have, it is said, lost considerable by the venture.

Niagara.—Messrs. Gensberger and Fitzgerald, who were the owners of a one-third interest in the Niagara mine, disposed of their interest to James P. Forbis for the sum of \$14,000. This property is now the subject of a lawsuit, it being alleged that a quantity of ore valued at \$242,000, has been taken from the Niagara workings through the Black Rock shaft. The Forbis Brothers will at once proceed to work this property, the shaft of which is developed to the 250-ft. level.

## NEVADA.

## Storey County—Comstock Lode.

Belcher Mining Company.—The latest official weekly letter says: "The extraction of ore has been, the stope on the sixteenth floor being carried 8 sets south. In stopping north from the raise the ore becomes narrower and poorer. Have shipped to the Brunswick mill for reduction during the past week 356 tons and 1,990 lbs. of ore, the average battery sample of which was \$32.78 per ton."

Consolidated Imperial Mining Company.—The latest official weekly letter says: "The west crosscut on the Sagebrush level is out 30 ft.; the face shows quartz having no value. General prospecting throughout the mine still goes on. We are taking out some ore from old fillings and small streaks found while prospecting."

Crown Point Mining Company.—The latest official weekly letter says: "The drift south of the fourth floor of the west stope on the 160-ft. level has been continued for the past week, following a streak of pay varying from 18 in. to 2 ft. in width of fair milling grade. We are still stopping on the fourth floor north, in ground composed partly of fillings and partly rock in place. What we are able to save is of good trade. In the south stope we are opening out to the east on a streak of ore of good grade, but narrow. The usual necessary repairs are being carried on throughout the mine."

Justice Mining Company.—The latest official weekly letter says: "The south drift from the north stope on the 82<sup>d</sup> level is out 50 ft. The car samples from the face average about \$25 per ton. The pay is from four to five feet in width. The raise on this level, 150 ft. south of the north stope, is up 60 ft. The top is in low grade quartz. Shipped to the Washoe mill for reduction during the past week 53 tons and 1,260 lbs. of ore, the average battery sample of which was \$29.03 per ton. Shipped on November 22d one bar of ballion, valued at \$3,884.77, the clean-up of 166 tons and 1,220 lbs. of ore."

Kentuek Consolidated Mining Company.—The latest official weekly letter says: "The second floor stope above the 160-ft. level has been carried north to the north line and stopped. We are now preparing to open the third floor at this point. In the main raise no change of importance has occurred during the week. A portion of the week has been occupied in putting in a chute at this point. Have shipped to the Mexican mill for reduction during the week 94 tons 364 lbs. of ore, but too late to report the battery sample this week."

Occidental Consolidated Mining Company.—At annual meeting of this company 78,389 shares were represented and the following officers were elected for the ensuing year: G. R. Wells, president; Nat Messer, vice-president, and A. S. Walberg, H. Zedig and E. B. Holmes, directors. A. K. Durhrow was re-elected secretary, and his financial statement showed an indebtedness of \$17,159.45, with an offset

of \$15,567.70 in bullion and concentrates. J. H. Kinkead was re-elected superintendent, and his report showed that during the year there were extracted from the several levels and openings in the mine 3,864 tons of ore, which were reduced at the company's mill. The assay value of all the ore extracted and milled was: Gold, \$5.90; silver, \$14.33; total, \$20.23 per ton, from which concentrates and bullion were produced aggregating \$66,339.20, of which \$19,862.64 was gold and \$46,476.56 silver. The yield per ton was \$5.11 in gold and \$12 in silver; total, \$17.11, being 86% of the gold contained in the ore and 83% of the silver. A concise and exhaustive report by Gott Haist, surveyor and civil engineer, on the Brunswick lode was presented in conjunction with the superintendent's report.

**Savage Mining Company.**—The latest official weekly letter says: "We have hoisted 594 cars of ore from the 800, 950, 1,100, 1,200, 1,400 and 1,450 levels. Shipped to the Nevada mill 525 tons. The average car sample assay was \$20.39. Average battery assay, \$18.65. Bullion yield for the week, \$6,851.25. On the 1,100 level the west crosscut, No. 1, started from the main south drift 180 ft., from south boundary is advanced 54 ft.; face is in porphyry. West crosscut 3, started 50 ft. north of No. 1, is advanced 46 ft.; face in porphyry. The usual prospecting and repair work is being carried on throughout the mine. The joint north drift with the Gould & Curry Company on the Sutro tunnel line was advanced 15 ft.; face of drift is in hard porphyry.

**Segregated Belcher Mining Company.**—The latest official weekly letter says: "The west crosscut from the south lateral drift on the 1,300 level has been advanced 22 ft., and is now out a total distance of 50 ft. It has cut a streak of quartz of from 12 to 18 in. wide, yielding low assays varying from \$3 to \$5 per ton, and the face is now in hard porphyry."

(From our Special Correspondent.)

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

Mine.	Tons hoisted.	Cars hoisted, as y.	Tons milled.	Average battery assay.	Bullion produced for week.	Bullion shipped.
					\$	\$
Belcher.....			856	32.78		
Con. Cal. & Va. Justice.....			53	29.03		3,884.77
Kentuck.....			91			
Ophir.....	53	27.30				
Overman.....	235	22.89	312	18.11		
Potosi.....	117		400	28.9		372½ lbs.
Savage.....	594	29.39	525	18.65	6,851.25	
Silver Hill.....						170¾ lbs.

<sup>1</sup> Clean-up of 166 tons of ore. <sup>2</sup> Total amount to date on November account \$33,407.61.

**Hale & Norcross Silver Mining Co.**—Judge Hebbard set Tuesday last as the day for hearing the motion of the plaintiff, in the suit of Fox versus the directors of this company and others, to proceed and levy execution under the judgment, notwithstanding the justification of the surety on the appeal bond, on the ground that the undertaking on appeal was insufficient. When the case was called W. M. Herrin, one of the defendant's attorneys, presented the court with a writ of prohibition from the Supreme Court, by which Judge Hebbard was enjoined from hearing the motion or considering any proposition relating to the insufficiency of the bond. He was cited to appear before the Supreme Court on December 5th, to show cause why he should not be perpetually enjoined from hearing any further proceedings relating to the bond.

The case as it stands is, to the non-legal mind, a simple farce. The Deputy-County Clerk, acting for the County Clerk, who is simply the clerk and keeper of records for the Superior Court of the State, allowed the defendants to justify on their bond, as already previously set forth, on the plea that he had no option in the matter, the Western Surety and Guarantee Company having complied with the letter of the law. Naturally enough the plaintiff wishes the matter decisively settled in equity by some one having competent jurisdiction, and carried the matter into the Supreme Court. For some absurd reason, or no reason at all, defendants wish the decision of the County Clerk, pro his deputy, to be final, and allege that no one has any right to go behind that decision, thus elevating the County Clerk to a dignity superior to a judge of the Superior Court. Some nice legal hair splitting may be anticipated when the case comes up before the Supreme Court, and whether a decision will be awarded on the merits or not remains to be seen.

**New York Mining Company.**—About ten car loads of ore are being taken out each day, the car samples averaging from \$36 to \$40 per ton. The bottom of the winze, 650 level, now down 73 feet on the slope, is in low grade ore.

**Sierra Nevada Mining Company.**—The work of stopping out north in the Cedar Hill drift continues. Some fair grade ore has been found. The joint Sierra Nevada and Union west drift, 900 level, has now been carried a total distance, west of shaft, 2,637 ft., the face being still in porphyry.

NEW MEXICO.

Grant County.

A small shipment of lead ore was made from Pinos Altos last week. There has been very little doing in the lead mines there for the past year, says the Silver City correspondent of the New York "Sun," and owners of lead mines there say that there is no profit in mining lead ore as long as present smelter rates are maintained and no better price can be obtained for lead. The production of the camp outside of the gold mines is insignificant, but it is still the largest gold producing camp in the Territory.

**Last Chance.**—The lessees of this mine at Silver Creek, have considerable good ore out at the mine and will soon be ready to start the mill. The ore is low grade, but it can be mined and milled at small expense. A strike has been made in the Eberle mine, and the outlook for the entire camp is reported to be better than it has been for more than a year.

Lincoln County.

**Old Abe.**—This mine at White Oaks has been closed down temporarily pending the erection of a mill.

Sierra County.

The smelter at Kingston has been blown in and the Standard Company's reverberatory furnace at Hillsborough will be started this week. The smelter at Hillsborough is running steadily and is producing over two tons of copper matte a day. Heretofore the matte has been shipped to Colorado to be refined, but the company will refine its own matte at Hillsborough in the future.

NORTH CAROLINA.

Gaston County.

(From our Special Correspondent.)

**Catawba Mine, Kings Mountain.**—As previously advertised, this mine was sold at trustees' sale on the 15th ultimo; the purchase price was only \$25,000, it being bought in by one of the former owners—Nathaniel Wilson, of Washington, D. C. The property is said to be a valuable one and it was expected that Mr. Wilson would get it. What his policy will be is not known, but at present the mine is kept unwatered and a little surface work is being carried on.

The new 30-stamp mill is beyond a doubt one of the best in the district, out it is to be regretted that some of the money put into it was not spent underground. The returns from the large bodies of low grade ore above the 320-ft. level were not up to expectations, but could probably have been made satisfactory by mixing with that of the rich shoots. All but one of these shoots are now under foot in that level, and while the expense of getting under them would have been considerable the results would have been commensurate. The percentage of tellurium in the ore is less than was anticipated and should give no trouble in the treatment of the concentrates. It is believed that an ore averaging \$1.50 per ton will pay expenses.

OHIO.

Stark County.

**Millport Coal Company.**—A fire has been burning in this company's mine at Massillon, for over a week. The company has fought it without intermission, with every appliance available, but without success.

Tuscarawas County.

**John Porter Fire Brick Company.**—This company of New Cumberland, O., has discharged 75 miners. The men say they are to be replaced by clay digging machines, each of which will do the work of from 17 to 20 men.

OREGON.

Jackson County.

**Ashland Mining Company, Ashland.**—The new quartz mill set up by this company within the city limits is now running night and day on rock from the company's mine. The property is situated two miles outside the town, and is yielding steadily a very fair grade ore.

PENNSYLVANIA.

Coal.

The average of anthracite coal prices in November in Schuylkill County was \$2.67 as against \$2.747 in October, \$2.358 in November last year and \$2.293 in November two years ago. Wages will be 6% above the basis as against 8% above in October.

The rate of wages to be paid the miners employed at the Philadelphia & Reading Coal and Iron Company's collieries in the Pottsville region for the last half of November and the first half of December was fixed on the 29th ult. at 6% above the \$2.50 basis. This is 2% below the rate of wages paid in October.

Speaking of the poor condition of affairs in coal mining circles in Wilkesbarre.—Mr. Elmer H. Lawall, Superintendent of the Lehigh & Wilkes Barre Coal Company is reported to have said: "The lack of work is caused chiefly by the scarcity of cars—that is, of empty cars. The great trouble is that there are hundreds and hundreds of loaded cars on the road which are not being used. You can say from me as authority for the Lehigh and Wilkes Barre Coal Company that if any of our employees are in actual want of anything they can have it, as the company will advance them credit and money. We do not want them to suffer because we cannot give them work, and I assure you if we could find employment for all they should have it."

The Schuylkill Coal Exchange has issued a circular dated Pottsville, Nov. 30, 1892, which shows the following collieries drawn to return prices of coal to determine the rate of wages to be paid, for the last half of November, and the first half of December, report as follows: P. & R. C. & I. Company, Ellan-gowan colliery, \$2.68; Elmwood colliery, \$2.61; Reliance colliery, \$2.55; Maple Hill colliery, \$2.84; Thomas Coal Company, Kehley Run colliery, \$2.66. The average of these prices is \$2.67 and the rate of wages will be six per cent. above the \$2.50 basis.

**Honeybrook.**—A despatch from Hazleton says that the fire which was supposed to have been extinguished in the Honeybrook Mine last week has broken out afresh. It is reported to be raging now above the main gangway. The interior of the mine has been so wrecked that a total collapse is anticipated, and workmen dare not enter it. This adds to the difficulty of reaching the flames, and it is feared that all efforts to extinguish them will prove futile. In this case the adjoining mines are endangered, and apprehension is felt by the operators, as the loss this would entail would be enormous. The vein now burning is one of the richest in the region, and mines which have been more recently opened are in the same basin. Millions of tons of coal are thus exposed to the ravages of the fire, and if the efforts which are now being made to extinguish it prove unsuccessful, this vast field of coal may be destroyed. Water is again being pumped into the mine.

**Langeliff.**—Owing to a cave-in at this colliery at Avoca on the 28th ult., the ground commenced to settle over the workings, causing some of the houses to topple over, while many others were more or less damaged. Experienced miners say that no further danger need be apprehended.

**Lykens Valley Coal Company.**—A despatch from Harrisburg announces that in the case of Elder vs. The Lykens Valley Coal Company the jury on the 29th ult., gave Elder \$1,507 damages for injury to his farm from washings from coal mines on Wisconsin Creek. A number of similar suits involving claims for thousands of dollars are still pending in the courts of this and adjoining counties. Farmers whose lands have been ruined for agricultural purposes by coal washings have for years been endeavoring to obtain compensation from the companies owning the mines, and it now looks, says the despatch, as though they would succeed.

**Philadelphia & Reading Coal and Iron Company.**—This company's statement for October, 1892, shows: Gross receipts, \$2,076,864.44; gross expenses, \$1,765,848.69 (including operating expenses, \$1,662,424.67; colliery improvements, \$93,630.54, and expenditures for permanent improvements, \$9,793.48); leaving profit from mining, \$311,015.75. From this is deducted \$68,000 as one-twelfth of the current year's fixed charges, thus showing a surplus for the month of \$243,015.75, an increase of \$68,664.77 compared with October, 1891. For 11 months of the current fiscal year there is a surplus of \$117,145.12. For the same period in 1891 there was a deficit of \$477,350.98

SOUTH CAROLINA.

(From our Special Correspondent.)

The original charter of the Coosa Company, granted in March, 1871, having expired, the Secretary of State has issued a commission for a new one. The incorporators are J. E. Adger, Edwa. McCrady, Jr., and Augustine T. Smythe, of Charleston; Moses E. Lopez and D. C. Wilson, of Beaufort, and David Roberts, of Bessemer, Alabama. The capital stock is stated at \$1,000,000, and the principal place of business to be at Charleston.

TENNESSEE.

Anderson County.

Contradictory rumors have been current during the week relative to an impending uprising of the miners against the Coal Creek convict camp. It is claimed that another attack may be made before Governor Buchanan's term of office expires on January 1.

Hamilton County.

(From our Special Correspondent.)

**Soddy Coal, Iron and Railroad Company.**—It is stated that H. S. Chamberlain and D. P. Montague, of Chattanooga, have purchased the mining plant of this company and leased the mines and coke ovens for a period of three years with the privilege of extending it for five years. As partial consideration the lessees assume the indebtedness of the Soddy Company. At present the output of the mine is about sixty five cars per day. Considerable improvement in the plant and development in the mine is contemplated.

UTAH.

Beaver County.

The contract for the annual output of the Horn Silver Mining Company for the coming year, has been awarded to the Germania Smelting Company. This company's bid for the low grade ore, with freight and working charges, was \$24.10, and its bid on the higher grades was \$25. The monthly output of the Horn Silver is estimated at 2,000 tons.

VIRGINIA.

Roanoke County.

(From our Special Correspondent.)

A shaft about 75 ft. deep has been sunk upon the property of R. R. Lunsford, near Roanoke, which is said to show up a body of iron ore 45 ft. in thickness. Washers, screens and the necessary power



plant have been put in, which is estimated will soon have a daily capacity of 100 tons. The ore is being shipped to the West End furnace in Roanoke. Whitehurst & Smith, who are doing the work, have also opened up a bed of limestone near Lithia, and are quarrying from 75 to 100 tons per day.

Wise County.

It is stated that G. H. Allen, of Louisville, Ky., has a 15 year lease on a 1,000-acre tract of coal land near Norton, and will develop it at once. Five hundred coke ovens are to be constructed, with a daily output of 500 tons.

WASHINGTON.

Stevens County.

(From our Special Correspondent.)

Dead Medicine, Colville.—This mine improves as development work progresses. It is estimated they have 1,000 tons of ore on the dump. Work is progressing on the concentrator, the capacity of which will be 30 tons per day. By Jan. 1st, 1893, everything will be in full running order.

Jay Gould, Chewelah.—One of the owners, T. F. Hertzell, reports that his company has a 100 ft. shaft and 25-ft. crosscut on this property.

State King, Kettle Falls.—Ten miles below Kettle Falls, slate was discovered last July, and specimens shown prove it to be one of the best in quality in this section. It is claimed for it that they have a dyke 50 ft. wide, easily quarried, and have a good road from quarry to the railroad.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

(From our Special Correspondent.)

Silver King.—This mine was located on Toad Mountain in 1886. It is about 12 miles from Nelson, B. C., on the west arm of Kootenai Lake, and at an elevation of 4,500 ft., and has a good wagon road to the lake. The ore is a most beautiful peacock ore and has assayed as high as \$10,000 to the ton. Thousands of feet of shaft work, stoping and tunneling has been done on this property and the greatest secrecy has prevailed for the past year as to the work of developing the same. This mine was bonded last summer for \$2,000,000 to a Scotch syndicate and the final papers have been drawn. The mine was discovered by accident. The outcroppings were first seen and specimens of the ore taken as a curiosity, on account of its beautiful color, it was only on assaying that its value was discovered, which warranted further investigation and the following year the Silver King was located.

CANADA.

Manitoba.

Gold mining at the Lake of the Woods, has a good outlook for the future and the Gold Hill, Sultana, Bull Dog, The El Divir, Treasurer and Rajah properties are likely to be continuously worked. The Gold Hill Mining Company are putting in a new plant, working on the Lede system, says the "Rat Portage News." The Sultana mine is being operated by Mr. J. F. Caldwell, of Winnipeg, and under the superintendence of Commodore Wm. Caldwell. A 10-stamp mill is being erected. About 20 men are at present employed and as soon as the mill is in operation, more men will be added as necessity demands. There is a very large body of rich ore exposed on the Sultana property, with enough already on the dump to keep the mill going for some time. Messrs. Upton and Barnes of the Bull Dog, and Mr. Webster of the El Divir and Treasure mines, have already ordered two 10-ton Crawford mills each and are getting their buildings erected as fast as men and money can accomplish it. The necessary buildings for the accommodation of the men, have been erected on the "Old Jef" location, an island near the Sultana. It is the intention of Mr. Hildreth, the energetic manager, to push the work of sinking during the winter. There is a large body of ore on this property, bearing a strong resemblance to the Sultana ore; and as it is only a short distance off and almost on the direct course of the main lode, there is a strong likelihood of its being a continuation of that vein.

CUBA.

The American whaleback steamship "Joseph L. Colby" was the first vessel to bring a cargo of ore to Philadelphia from Sigua, Cuba, for the Sigua Iron Company. Sample of this was taken by Andrew S. McCreath of Harrisburg, Pa., who reported analysis as follows: Metallic iron, 65.850; copper, 0.008; sulphur, 0.037; phosphorus, 0.015; alumina, 0.081; lime, 0.0260; magnesia, 0.172; silica, 3.350.

An analysis made by the furnace receiving this cargo made from their own samples showed: Metallic iron, 66.61; phosphorus, 0.010. A portion of the same cargo also went to the Midvale Steel Company, who report the following as their analysis: Metallic iron, 67.567; phosphorus, 0.014; sulphur, 0.026; alumina, 0.709; lime, 0.620; silica, 1.400; magnesia, 0.111.

The second cargo of 2,400 tons was brought by the English steamship "Torgorm," which arrived here November 17th; sample taken and analyzed by Prof. Andrew S. McCreath, of Harrisburg, Pa., showed the following: Metallic iron, 63.350; phosphorus, 0.014.

MEXICO.

Durango.

Candelaria Mining Company.—A shipment of bullion, consisting of fifty bars, valued at \$56,000, has been received at the San Francisco office.

NEW SOUTH WALES.

Australian Emeralds.—In the neighborhood of Emmaville, New South Wales, the New Emerald Proprietary Mining Company has been working emerald deposits there with more than encouraging results. A large collection of the stones was sent to Mr. Edwin H. Streeter, the London gem expert, and he has reported as follows: "I have made a thorough examination of your emeralds both in matrix, rough, and as cut stones, and have no hesitation in pronouncing them to be true emeralds of a bright, lustrous green. They are more free from feathers than any I have ever seen. Although light in color, they are valuable commercially. When in the progressive development of the mine a greater depth is reached, no doubt darker stones will be found of higher value. The mine should have a great and important future in store."

NOVA SCOTIA.

Truro Gold Mining Company.—Considerable excitement prevails here in consequence of a discovery of good gold ore at the Caribou mines.

SOUTH AFRICA.

Transvaal.

Information has reached the Birthday Company of the discovery of a new gold belt on the Sinquitz River, some 20 to 25 miles northeast of that camp. The discovery was made by Mr. A. Boggie, who has prospected in Mashonaland and elsewhere for some time past with successful results. The new find is in the Sinquitz Valley, and shows fine visible gold. The formation is perhaps better defined and more easily traced than that of the Birthday and Ellerton, as the talcose and micaceous slate stands in some places 8 to 10 ft. above the ground. The reefs give fine prospects through a body of stone 10 to 12 ft. thick. Water is plentiful. The Sinquitz River winds through and crosses the formation along the whole length, and in the driest season the water does not give out.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 550 and 552.]

NEW YORK, Friday Evening, Dec. 2, 1892.

Nothing of interest has occurred in the mining market since our last report. The business has been small as to volume and devoid of any special significance—in short, it has been the kind of a mining market to which we have become accustomed.

The Comstocks, generally speaking, show no change from last week. Consolidated California & Virginia was dealt in to the extent of 675 shares at \$2.80@3; the last sale was made at \$2.80. Of Hale & Norcross only 200 shares changed hands at \$1.50@ \$1.65. There was a solitary sale of 100 shares of Ophir at \$2.75. Other sales were as follows: 600 shares of Comstock Tunnel stock at 9@11c.; of the bonds there were sales of \$2,500 at 15@16.50; 200 shares of Savage at \$1.45@1.50; 100 shares of Bullion at 85c.; 100 shares of Mexican at \$1.70; 200 shares of Potosi at \$1.60@2.25.

No Tuscarora stock was dealt in during the week.

Of the California shares, Quicksilver, common, was dealt in for the first time in many months; 122 shares were sold at \$16@17. Standard Consolidated shows sales of 700 shares at \$1.50. There was a single sale of 100 shares of Belmont at 35c. Of Brunswick, sales officially reported aggregated 1,500 shares at 10@12c. The latest official letter from the superintendent of the Brunswick Consolidated Gold Mining Company says: "For the week ending November 23 the shaft has been sunk 4 ft.; total depth, 680 ft. The east drift was extended 7 ft.; total 108 ft. The West drift was extended 6 ft.; total, 118 ft. Both the shaft and the West drift are in good pay ore. The ledge is 2 ft. wide in the shaft; the West drift it is 10 in. and increasing. The East drift is in ore but not so good; it is sulphuret ore, but not high grade. All the machinery on top has been overhauled and repairs made for the winter, as I anticipate more water in the mine."

The Albany Gold Mining Company has started up work in the Astoria, Middle Field and Merrimac claims, the deeds to those properties having been secured.

Of the Colorado stocks the most active was Leadville Consolidated. Sales amounted to 13,299 shares or more than one half of the total number of shares of all stocks during the week. The price ranged from 16 to 18c. At the close, the first mentioned figure ruled. The superintendent of the company writes:

"The outlook is very favorable for a large output this month (November). We are still taking out ore in the Hegeman shaft, second contact." Of Chrysolite 1,200 shares changed hands at 16@18c. Sales of Little Chief amounted to 700 shares at 25c. Robinson Consolidated shows a sale of 100 shares at

28c. Of Silver Cord 500 shares changed hands at 32c., and of Small Hopes 300 shares at 95c. A sale is reported of 500 shares of Lacrosse at 4c.

Of the Black Hill stock Caledonia shows transactions amounting to 500 shares at 75c. An equal number of shares of Father de Smet was sold at 23@24.

Of the Utah shares Horn Silver was very quiet, only 200 shares being sold at \$3.55. Ontario was less active than last week. Officially reported sales amount to but 200 shares at \$20@21.

Phoenix of Arizona was very quiet this week; only 120 shares were sold at 50c.

Boston.

Dec. 1.

(From our Special Correspondent.)

Copper stocks have been quite active the past week, and values have tended upward with slight reactions incident to the condition of the general market. The strong position of ingot copper and the general belief that higher prices will rule during the ensuing months, has imparted confidence to holders of the producing copper stocks, and induced buying by the public to a greater or less extent. Speculation is largely in the Montana mines which afford wider fluctuations, and are more easily manipulated than the lake stocks. Sales of Boston & Montana and Butte & Boston aggregated over 10,000 sales for the week, being more than all the rest combined.

Boston & Montana sold up to \$35½ and reacted to \$34½, while Butte & Boston advanced \$13, losing \$1 in the later dealings. Calumet & Hecla advanced to \$295 for 5 shares, but lost the advance and sold at \$290 latest sale. Tamarack was quite strong up to today at \$164@165. A statement in a morning paper that the company might reduce the dividends to \$12 per annum caused a decline to-day to \$160 with some pressure to sell stocks.

Osceola was one of the strongest stocks on the list and advanced from \$35½ to \$38, with only a decline to \$37½ to-day. About 2,500 shares were dealt in and the buying was considered good for investment.

Quincy sold up to \$144, a gain of \$4½ for the week. The output for November was 900 tons, and at the present price of copper Quincy will make a good showing the next few months.

Centennial continues dull and heavy and shows a decline for the week to \$8, a loss of ¼.

Kearsarge seems to be gaining in popular favor, advancing from \$12½ to \$14½. The mine is still in the experimental stage, and may or may not become a valuable producer, although at present its outlook is more promising than at any period in its history.

Franklin does not seem to feel the advance in the rest of the list. It holds steady at \$14¼@14½, touching \$14½ at one time during the week.

Atlantic shows signs of weakness from some unexplained cause, and after selling at \$11½ declined to \$10½.

Copper Falls appeared this week and sold at \$7½@7¾. The last recorded sale, if memory serves, was at \$8. A letter from the mine says "that the ashbed produced more copper last month than ever before, mostly from the new ground opened up in the last two years."

Allouez sold at \$1; Arnold advanced to \$1½. The report that the mine was closed for the winter was without foundation.

Wolverine sold at \$1¼, a decline of ¼.

Tamarack, Jr., sold up to \$26½ during the week, but declined to \$25 on reports that the mine was not coming up to the expectations of its friends.

Napa Quicksilver declined to \$5¼ and Catalpa sold at 19c.

3 P. M.—The market was inclined to be weak after the noon hour. Boston & Montana sold down to \$34½; Butte, to \$12½; Kearsarge, to \$13½, and Tamarack to \$153. Others unchanged.

San Francisco.

Nov. 25.

(From our Special Correspondent.)

The market for mining stocks has been dull during the week, Pine street having given itself up to Thanksgiving—but not for active stocks—in the hope that with the return of James L. Flood there may be an improvement in the situation. Assessments have been in order lately, the following having been levied during the week: North Gould & Curry, 10c.; Consolidated Imperial, 3c.; Gould & Curry, 25c.; Del Monte, 10c.; East Best & Belcher, 20c., and Commonwealth, 10c. Toll having been levied to this extent, it is not surprising that the market should have suffered. The Mayflower Gravel Mining Company, of Placer County, that has been making such a good showing lately, has had its stock listed at the Pacific Stock Exchange, and presumably will now conduct business on the Comstock method. The step taken of listing the stock is to be regretted, for to date the mine has been numbered among those honestly administered.

Trading has been largely confined, during the current week to Potosi, Belcher and Consolidated New York. The latter stock has advanced on the report that the milling test of 100 tons of ore worked has turned out better than anticipated.

The North End Comstocks have shown a decline on the week's trading, Consolidated California & Virginia having sold for \$2.75; Mexican, \$160; Ophir, \$2.60; Sierra Nevada, \$1.15, and Union Consolidated, \$1.25.

Of the middle group of Comstocks, Potosi has been the most in demand, selling to-day for \$1.50. This price, however, is a decline of 30 cents on the week's trading. The raise in the mine continues in good ore and a smart rally in this stock is within the pos-

sibilities. Best & Belcher has sold steady at \$1.50; Hale & Norcross, at \$1.45; Chollar, at 80c.; Gould & Curry, at 80c., and Savage, at \$1.30.

Of the South End and Gold Hill stocks Belcher has been the most active, with the exception of Consolidated New York, which has sharply advanced within the last day or two. The principal work now being carried on in the mine is in the south drift from the wings below the 650 level.

No dealings have been made on outside save to establish a rate. Of the Bodies, Bulwer Consolidated sold for 15c.; Bodie Consolidated for 10c. and Mono for 18c.

In the Tuscarora group, for Belle Isle, Del Monte, Grand Prize, Navajo, North Belle Isle, North Commonwealth and Nevada Queen there was 5c. bid, 10c. being asked for the two last named.

Of the Quijotoas, Central, Crocker and Peerless, were bid for 10c. and Peer for 15c.

The market closed with prices steady, a healthy tone pervading the general line of stocks.

MEETINGS.

Ballard-Smuggler Mining Company, as the office of the company, No. 205 Mining Exchange Building, Denver, Col., January 2d, at 10 A. M.

Barnum Tunnel Gold Mining and Development Company, at the office of Messrs. Adams & Hyde, No. 59 Liberty Street, New York, December 7th, at 12 o'clock noon.

El Oro Mining Company, at the Office of the company, in New York City, December 17th, at 1 P. M.

Mt. Diablo Mill and Mining Company, at the office of the company, No. 318 Pine street, San Francisco, Cal., December 19th, at 1 P. M.

Mexican Gold and Silver Mining Company, at the office of the company, No. 309 Montgomery street, San Francisco, Cal., December 6th, at 1 P. M.

New Central Coal Company, at the office of the company, in New York City, December 13th, at 12 o'clock noon.

San Sebastian Gold Mining Company, at the office of the company, in New York City, December 3rd, at 11 A. M.

DIVIDENDS.

Calumet & Hecla Mining Company, a dividend of \$5 per share, \$500,000, payable December 16th, at the office of the company in Boston, Mass.

Enterprise Mining Company, a dividend of 10c. per share, \$5,000, payable December 15th, at the office of the company, No. 33 Wall Street, New York. Transfer books close December 10th, and reopen December 16th.

Golden Reward Mining Company, paid dividend No. 12, of 2c. per share, \$5,000, November 25th, at the office of the company in Deadwood, S. Dak.

National Lead Company, dividend of 1 1/4% on the preferred stock, payable December 15th, at the office of the company, No. 1 Broadway, New York City. Transfer books close November 28th, and reopen December 16th.

Standard Consolidated Mining Company, a dividend of 10c. per share, \$10,000, payable December 23d, at the office of the company in San Francisco.

ASSESSMENTS.

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

METAL MARKET.

NEW YORK, Friday Evening, Dec. 2, 1892. Prices of Silver per Ounce Troy.

Table showing prices of silver in various currencies: Nov. Sterling, London, N. Y. Cents, Value of sil. in \$.

\* December. Silver continues to be in good request, and shipments to London have been constant during the past week. The disposition of England to treat the silver question seriously had the effect of stiffening the price of silver, but as the later reports from the Conference do not appear to be so rosy, silver closes weaker.

There were sold during the week ending Friday, December 2d, 335,000 ounces in silver bullion certificates, at from 85 to 86 1/2 cents per ounce.

The United States Assay Office at New York reports the total receipts of silver for the week to be 118,000 ounces.

Gold and Silver Exports and Imports at New York for Week Ending November 26th, 1892, and for Years from January 1st, 1892, 1891.

Table comparing Gold and Silver exports and imports for the week ending Nov 26, 1892, and for the years 1892 and 1891.

During the week ending Dec. 2 the exports and imports, so far as ascertained, have been as follows: Exports, gold, \$1,224,700; silver, \$574,950. Imports, gold, \$182,234; silver, \$10,107.

The greater part of the gold went to Havre and the silver to England.

The export of gold has commenced, but it is believed that no large amount of the metal will leave us. As yet, the rate of exchange has not reached a figure that permits of the exportation of gold at a profit—in fact, it is said that the \$600,000 sent to Havre last week was sent at a loss of 1/4 of 1%.

In view of these facts, there should be no alarm felt as to the immediate depletion of our stock of gold. Russia and Austria are now buying gold, paying a small premium for it and this, in all probability, largely accounts for the present outward movement.

NOTES OF THE WEEK.

The sensation of the week in financial circles has been the plan submitted by M. de Rothschild to the Monetary Conference, and which is given on another page. This proposal has not received favorable comment. Mr. Bland says it is villainous, and would demoralize one-third of the silver currency of the world, or cause a direct contraction of the currency by \$1,300,000,000.

F. A. Palmer, president of the Baoadway National Bank, says: "If the plan were carried out, we would have all the silver, and they all the gold." Mr. St. John, president of the Mechanical Bank, says: "I cannot believe that it is intended as anything but a basis for discussion." Mr. W. L. Bull says: "It shows the anxiety of England and European nations to have us continue the present ridiculous policy of purchasing silver."

On the whole it may be said that it is difficult to understand why it was made unless it was merely intended to serve as a basis for discussion, a "feeler" upon the pulse of the Conference.

Its propositions are so manifestly unfair that the exactness of the cable report has been questioned. During 1891 the silver coinage of the large European countries was according to the report of the Director of the Mint, as follows: Great Britain, \$5,141,594; Spain, \$11,251,000; Portugal, \$7,277,040; Germany, \$1,139,252; Austria-Hungary, \$3,035,799; Russia, \$2,690,992, or a total of \$30,535,587.

It is reported in a late cable that the special committee having M. Rothschild's plan under consideration has decided to report against it, and that the committee will now proceed to decide upon the combined Rothschild and Soetbeer's plans, with modifications proposed on behalf of the Latin Union.

Mr. Henry W. Cannon, the American member of this committee, and who, it is said, will probably vote that the Conference consider the Rothschild plan in an amended form, cables as follows concerning the Conference and the bearing of its work on our silver purchases:

"If no monetary agreement is reached through the efforts of this body, and if the United States finds no responsive voice in Europe to its appeal for the restoration of silver, it would then appear that our best course would be the repeal of the law of July, 1890, and to go out of the market as purchasers of silver for currency purposes until such time as an international agreement can be made as to the relative value of gold and silver."

"In my opinion (which, I believe, is shared in by a large majority of our people), it is not possible for the United States of America alone to fix and maintain the ratio between gold and silver for all the world, and from present indications the mints of the United States will not only not be opened for the free coinage of silver, but a lesser rather than a greater use of the white metal as money will occur in our country unless some reasonable international agreement can be made in the near future.

"If gold monometalism is to prevail among the principal commercial nations, the United States, with its enormous and increasing foreign commerce, with its high credit, with its large stock of gold and its rich mines of the same metal, will be compelled not only to cease purchasing silver for currency purposes, but to take such steps as may be necessary to increase, maintain and retain its stock of gold."

The plan proposed by the Editor of the ENGINEERING AND MINING JOURNAL on another page has received the warm indorsement and approval of many of our leading financial lights and it is to be hoped will be presented to the conference.

Coinage at the Mints of the United States.

The following statement shows the coinage executed at the Mints of the United States during November:

Table showing coinage statistics: Denomination, Pieces, Value. Includes Double eagles, Half eagles, Total gold, Standard dollars, Half-dollars, Quarter-dollars, Dimes, Total silver, Minor coinage, Total coinage.

Domestic and Foreign Coin.

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

Table of foreign coin market quotations: Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twentymarks, Spanish 25 pesetas.

Copper.—The market is very firm, all the Lake companies bidding for 12 1/2c. while 12 1/2 is freely bid for ingots and 12 1/4 for cakes and wire bars without finding takers. A large amount of business has been done in casting copper, the price of which has advanced to 11 1/2, with the good demand continuing. Arizona pig copper, 90% is held for 10%, but there is nothing to report as having been done in it.

Consumers have been but little affected, but as their stocks are low it is supposed that they will soon have to enter the market. We quote for refined and manufactured as follows: English tough, \$51 @ \$51 10s.; best selected, \$51 10s. @ \$52; strong sheets, \$50 @ \$50; India sheets, \$55 @ \$56; yellow metal, 5 1/4 d. Statistics in the second half of November decreased 650 tons abroad.

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

Table of copper exports: To Liverpool, To Rotterdam, To Reval, To S. Francisco, To S. La Champagne, To S. Amsterdam.

Tin.—The market has been rather flat and values dropped to 20 1/2 and even 5 0/75; but then came a reaction, and the closing figures are 20 1/2 for spot and December, 20 3/4 for January and February, and 20 1/2 for March to June. Shipments from the East during the second half of November were but 200 tons, and the quantity afloat to this country is now much reduced. Consumption is good. London has been rather weak, but prices there are still above the parity of those here.

Lead has, on the whole, been rather dull, and there are sellers over at 3 3/4 for New York delivery. At this low price there neither is a larger demand nor a smaller production. We have to quote 3 3/4 to 3 7/8. In London more business was done and less material is being offered for sale. Spanish lead advanced to £10 1s. 3d. @ 2s. 6d., while English lead is quoted at 2s. 6d. more.

Chicago Lead Market.—The Post-Boynton-Strong Company telegraphs us as follows: "The market has been quiet and dull at 3 60c. and 3 55c. with only a jobbing trade doing and all large consumers entirely out of the market."

St. Louis Lead Market.—The John Wall Commission Company, telegraph us as follows: "Lead stationary at 3 50c. with sellers and buyers about equally divided at that."

Spelter remains very quiet, with little business doing, at 4.10 New York. The foreign market has eased off somewhat and closes at £18 15s. for good ordinaries and £19 for specials.

Antimony is slightly easier, Cookson's at 11 1/4 c., L. X. at 11c. and Hallett's at 10 1/4 c.

Nickel—There is no alteration; we hear of no sales, and the quotations are nominally 55 1/2 @ 55c.

Quicksilver.—During the week trading in quicksilver has been of the ordinary nature and devoid of speculation. Quotations are: New York, \$38, and London £6 10s.

**IRON MARKET REVIEW.**

New York, Friday Evening, Dec. 2, 1892.

**Pig Iron Production.**—The following table gives the number of furnaces in blast and the estimated production of pig iron in the United States during the week ending Saturday, November 26th, 1892, and for the corresponding week ending Saturday, November 28th, 1891. Also the total estimated production from January 1st of each year to these dates. This table has been corrected by the official returns of the American Iron and Steel Association for the first six months of this year. The figures are in gross tons:

**Pig Iron Production During Weeks Ending November 28th, 1891, and November 26th, 1892, and During Both Years to These Dates.**

Fuel used.	Week ending		From			
	Nov. 28, '91.	Nov. 26, '92.	Jan., '91.	Jan., '92.		
	F'cs.	Tons.	F'cs.	Tons.	Tons.	Tons.
Anthracite...	87	34,860	69	31,000	1,675,760	1,568,796
Coke.....	162	142,870	133	130,000	5,150,680	6,191,700
Charcoal....	57	12,460	42	9,500	507,767	480,525
Total.....	306	190,190	244	170,500	7,633,507	8,244,021

Prices here are as last week. Southern, ex-steamer, No. 1 F., \$15.26; No. 2 F., \$14.26; No. 3 F., \$13.76; Gray Forge, \$13.01; Northern, tide-water, No. 1 X, \$15; No. 2 X, \$14; No. 2 plain, \$13.50; Gray Forge, \$13. Southern irons are quoted, nominally, 26c. higher than Northern.

**Spiegeleisen and Ferromanganese.**—Ferro 80% has been sold at something above \$61.09 and is firm. Spiegel, \$26.50 with no special movement.

**Steel Rails.**—The market is dull at \$30.

**Rail Fastenings.**—Prices rule as follows: Fish and angle plates, 1.55 @ 1.65c. at mill; spikes, 1.90 @ 2c.; bolts and square nuts, 2.40 @ 2.70c.; hexagonal nuts, 2.70 @ 2.80c., delivered.

**Merchant Iron and Steel.**—Prices stand: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6 1/2 @ 7 1/4 c.; special grades, 13 @ 18c.; crucible machinery steel, 4.75c.; crucible spring, 3.75c.; open hearth machinery, 2.25c.; open hearth spring, 2.30c.; tire steel, 2.25c.; toe calks, 2.25 @ 2.50c.; first quality sheet, 10c.; second quality sheet, 8c.

**Structural Iron and Steel.**—We quote: Beams, 2.3 @ 2.55c., except for 20-in. beams which are 2.75c.; angles, 1.95 @ 2.15c.; sheared plates, 1.90 @ 2.10c.; tees, 2.3 @ 2.60c.; channels, 2.35 @ 2.50c.; universal plates, 2 @ 2.10c.; bridge plates, 2 @ 2.10c.; steel hoops, 1.90 @ 8c. All on dock.

**Buffalo.** Dec. 1.

(Special Report by Rogers, Brown & Co.)

Business in pig iron is joggling along at its normal rate with a larger amount entering into consumption than is usual at this season of the year. Prices are stationary, with no immediate prospect of change. Southern irons are in the rather unusual condition of selling some grades at figures higher than the equivalent grades of their Northern competitors, the reason being their desirability in mixture, and the firm manner in which their recent advance in price has been sustained. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 X, Foundry strong coke iron Lake Superior ore, \$15.25; No. 2 X, Foundry strong coke iron Lake Superior ore, \$14.50; Ohio strong softener, No. 1, \$15.50; Ohio strong softener, No. 2, \$14.50; Jackson County silvery, No. 1, \$17.20; Jackson County silvery, No. 2, \$16.80; Lake Superior charcoal, \$18.00; Tennessee charcoal, \$18.00; Southern soft, No. 1, \$14.10; Alabama car wheel, \$19; Hanging Rock charcoal, \$20.50.

**Chicago.** Dec. 1.

(From our Special Correspondent.)

The closing month of the quarter and also of the year opens with a much quieter feeling in the iron and steel market in the Western metropolis, ascribable in a large degree to the approaching end of the season when nearly all establishments, foundries, factories and mills commence inventorying. The months of September, October and November have been active for all grades of crude iron and its finished products, and the conditions which at present surround the trade are of such a nature that there is no apprehension as to the near future. That is to say, the political uncertainties of to-day will be very little if at all more pronounced three or four months hence than they are now, and although they may exert a certain influence in restricting and contracting enterprises which had been contemplated, the volume of business will during that period show little curtailment. Another phase is assured, it will conduce towards bringing producer and consumer into closer relationship with regard to supply and demand.

Crude iron is quieter and several furnaces which

have already made some preparations to go into blast will probably postpone doing so until after the holidays. Some weakness is noted among the smaller Southern furnaces, and though values generally are fairly well sustained there is an undercurrent of less strength which does not as yet affect quotations.

**Pig Iron.**—With regard to the Southern iron, while it is true that agents of some of the larger producers are holding firmly to prices, there are others who are shading them. Buyers of Southern iron manifest no disposition to take on new contracts and not a few are requesting the withholding of shipments for a while; this, however, is incidental to the season. If no new furnaces go into blast; if the consumption of iron during the winter months equals that of the autumn, and if the visible supply shows a reduction in November, then and then only will Southern producers be able to sustain values. Hence prospects are less hopeful. Local coke iron was quiet last week, broken as it was by "Thanksgiving." Demand was chiefly confined to carloads and upward to 100 tons larger orders were few and far between. Sellers anticipate little increased activity until after the holidays. Lake Superior charcoal iron is also very quiet, but prices are well maintained as the furnace output is well sold up.

Quotations per gross ton f. o. b. Chicago, are Lake Superior charcoal, \$16.07 @ \$17.25. Lake Superior coke, No. 1, \$14.25 @ \$14.75; No. 2, \$13.75 @ \$14; No. 3, \$13.25 @ \$13.75; Lake Superior Bessemer, \$15.50; Lake Superior Scotch, \$15 @ \$15.50; American Scotch, \$16.50 @ \$17; Southern coke, foundry No. 1, \$14.50; No. 2, \$13.10; No. 3, \$12.85; Southern coke soft, No. 1, \$13.85; No. 2, \$13.10; Ohio silveries, No. 1, \$17; No. 2, \$16.50; Ohio strong softeners, No. 1, \$17; No. 2, \$16.50; Tennessee charcoal, No. 1, \$17; No. 2, \$16.50; Southern standard car wheel, \$20 @ \$21.

**Steel Billets and Rods.**—Further orders for either of these specialties cannot be accepted by local mills. Nominal quotations are \$26 for billets and \$35 for rods.

**Structural Iron and Steel.**—Current demand for use this season is light for architectural and bridge work. There is, however, a fair inquiry for material for next year, and the prices made are on a lower basis. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$2 @ \$2.20; tees, \$2.35 @ \$2.45; universal plates, \$1.95 @ \$2; sheared plates, \$1.95 @ \$2; beams and channels, \$2.35 @ \$2.50.

**Plates.**—Mill orders are much lighter, but warehouse business continues moderately good without activity. Some dealers and agents are inclined to shade prices. Steel sheets, 10 to 14, \$2.30 @ \$2.40; iron sheets, 10 to 14, \$2.20 @ \$2.30; tank iron or steel, \$2.05 @ \$2.15; shell iron or steel, \$2.50 @ \$2.75; firebox steel, \$4.25 @ \$5.50; flange steel, \$2.75 @ \$3.00; boiler rivets, \$4.00 @ \$4.15; boiler tubes, all sizes 65% and firm.

**Merchant Steel.**—There is a moderate amount of business still offering, but it is in small lots from car-loads up to fifty tons. The season has been active and mills are full of orders. We quote: Tool steel, \$6.50 @ \$6.75 and upward; tire steel, \$2.10 @ \$2.20; toe calk, \$2.40 @ \$2.50; Bessemer machinery, \$2.10 @ \$2.20; Bessemer hars, \$1.75 @ \$1.80; open hearth machinery, \$2.40 @ \$2.60; open hearth carriage spring, \$2.25 @ \$2.30; crucible spring, \$3.75 @ \$4.

**Galvanized Sheet Iron.**—Car load demand from mills is fair and more house trade moderate, but there is no activity. Discounts remain unchanged at 70% and 10% off on Juniata and 70 @ 15% and off on charcoal, and jobbing quantities at 70% @ 5% off on the former and 70% and 10% off on the latter.

**Black Sheet Iron.**—Manufacturers, consumers and jobbers are buying in moderate quantities. We quote iron sheets at 2.05c. for No. 27, common; steel sheets are 3c. Jobbers quote 3 @ 3.10c. for iron and 3.10 @ 3.15c. for steel, same gauge.

**Bar Iron.**—A thousand tons of car iron was placed at 1.60c. flat, this week. Orders are becoming scarce from all sources, and general quotations are 1.60c., half extras, though some mills which hold out for 1.62 1/2 c. are taking few if any orders. Jobbing prices are 1.75 @ 1.85c. rates, and about 10c. added for soft steel bars.

**Nails.**—Wire nails are less active, and mill price is now 1.60c. base, f. o. b. Chicago. Jobbers quote 1.70 @ 1.75c. from stock. Steel cut nails are in light mill demand at \$1.60 @ 30c. average. Jobbing prices 1.65 @ 1.70c. from stock in less than car loads.

**Steel Rails.**—The centering of all efforts upon the improvement of mileage, already constructed for the increased traffic next year, has unavoidably postponed several important extensions contemplated by railroads whose eastern terminals are here. These, however, will undoubtedly be pushed to completion next season, and will require large tonnage of rails and track material. One road has already contracted with the Denver mills for a portion of its rails. Current demand is light at \$31 @ \$32. We quote 1.70c. for iron or steel splice bars; spikes, \$2.05 @ \$2.15 for 100 lbs.; track bolts, hexagonal nuts, \$2.65 square, \$2.55.

**Scrap.**—Cast grades are in fair request, but all varieties of wrought iron and steel are very quiet. No. 1 railroad, \$15.50; No. 1 forge, \$15.00; No. 1 mill, \$9.50; fish plates, \$16.50; axles, \$19; horseshoes, \$16; pipes and flues, \$7; cast borings, \$6; wrought turnings, \$8; axle turnings, \$9.50; machinery castings, \$10; stove plates, \$6.50; mixed steel, \$10.50; coil steel, \$15; leaf steel, \$15.50; tires, \$14.50.

**Old Material.**—Bids of \$19.25 delivered by mills in Southern parts of the State have been refused by holders here. Consumers in this vicinity refuse to pay over \$18.50. Steel rails are dull at \$12.50 @ \$15, according to length. Car wheels sell in small lots at \$15.25 @ \$15.50.

**Louisville.** Nov. 26.

(Special Report by Hall Bros. & Co.)

There has not been much activity to the market during the week under review, but consumption is large, and a good run of general orders are reported. In the South, Gray Forge is strong and very difficult to obtain, and is, doubtless, the strongest grade on the list; foundry grades are in more abundant supply, but prices on all grades are held firm. There is no excitement in the market, and no material change in prices is looked for in the near future.

**Hot Blast Foundry Irons.**—Southern coke No. 1, \$13.50 @ \$13.75; Southern coke No. 2, \$12.50 @ \$12.75; Southern coke No. 3, \$12 @ \$12.25; Southern charcoal No. 1, \$16 @ \$17; Southern charcoal No. 2, \$15.50 @ \$16.

**Forge Irons.**—Neutral coke, \$11.50 @ \$12.00; mottled, \$11 @ \$11.25.

**Car Wheel and Malleable Irons.**—Southern (standard brands), \$20 @ \$21; Southern (other brands), \$18.50 @ \$19.50; Lake Superior, \$19.50 @ \$20.50.

**Philadelphia.** Dec. 2.

(From our Special Correspondent.)

**Pig Iron.**—The market continues strong under a steady demand for mill and foundry irons. Consumers are doing better than was expected of them, and yet very little iron is contracted for beyond 30 or at latest 60 days' delivery. The foundryers are particularly anxious at present to pick up standard brands, which, if it must be put in print, are not as readily had for prompt delivery as some iron trade reviews would have it appear. Forge irons are also being liberally bought, but there is more on the market than finds takers. Buyers will not anticipate until they can see more clearly. Standard No. 1 averages \$15 @ \$15.50; No. 2, \$14 @ \$14.75; forge, \$12.75 @ \$13.50.

**Muck Bars.**—The market is weak at \$25 @ \$25.50.

**Steel Billets.**—Small orders for early delivery are taken at \$26.50 @ \$27. Large consumers decline to give out orders for January or later deliveries at asking prices, and claim that business will yet be done in a large way at \$1 to \$1.50 less than to-day's prices.

**Merchant Iron.**—The situation is just what it has been for weeks past. Despite growls of dull demand all mills are running along as usual at 1.60 @ 1.75c.

**Nails.**—Firmness characterizes the market at the existing low rates, but the manufacturers have decided that a partial restriction for about two months will lay the foundation for a slight advance in the early spring.

**Sheet Iron.**—A quiet scramble has been going on for winter business and the result is a shading on large late delivery orders. On small early orders, especially for light sheets, prices are str.-ng.

**Skelp makers** found it advisable to shade quotations to induce large buyers to place orders.

**Plate and Tank.**—Shell and flange orders were booked this week at 2.25 and 2.50 respectively; tank plates, 1.80. All the mills are doing well, but the big orders that occasion bitter competition are not yet within sight. Large buyers claim the market will weaken.

**Structural Material.**—Sharp competition this week for a few desirable orders brought prices a little lower on angles and plates than they have been for some months. Quotations, 1.85c.; beams, tees and channels, 2.20c.

**Steel Rails.**—The representative steel rail makers admit there is an increase in projections of railroad building, but it will be some time before a decided improvement will take place. Quotations, \$30.

**Old Rails.**—There is a good supply at \$18 for iron and \$15 for steel.

**Scrap.**—No. 1 railroad is in fair supply at \$155.00.

**Pittsburg.** Dec. 1.

(From our Special Correspondent.)

**Raw Iron and Steel.**—Trade since our last, while somewhat dull, has been reasonably satisfactory in regard to certain articles. Buying has been unquestionably on a smaller scale, but consumption is the real test, and up to the present date there is but little perceptible change from the months immediately preceding. Another view—The conditions surrounding the iron trade at present are such as to give the warrant of solidity to every symptom that counts for the better.

The heavy demand in nearly every department of the market beginning with raw iron, is still the leading factor. Actual orders are taking stock from furnaces about as fast as made, and the hardening tendencies of prices continues. Bessemer pig is attracting attention for the demand furnished by the enormous consumption of soft steel and the better prices sellers are able to secure. The fact that most of the leading producers have largely contracted for these outputs until after the beginning of the year clears the situation of any depressing effect which a slackened demand would otherwise have upon prices.

There is no expectation that there will be any appreciable increase in demand until after the advent

of the new year; but there is no fear that the consumption will not take care of all the output at the present rate of production, and thus prevent any further accumulation of stocks. It is a well known fact that during the past two months the sales have been of such magnitude as to absorb the production, and, in addition, to draw liberally on the unsold iron on hand; but with the increase in the number of active furnaces there is a disposition on the part of buyers who have not contracts ahead to await the developments of the next few weeks before purchasing much in excess of what is actually needed to cover immediate requirements. A leading Eastern dealer on the outlook:

For the present the iron trade will not consider it any particular hardship to have a proposed new bar mill dropped at one point, a plate mill at another, and blast furnaces still at other points, and the same principle will doubtless apply to many other interests besides those in iron and steel. Anything that was legitimately called for three months ago will doubtless be forthcoming in due season, while ventures that have only a speculative value are just as well to be left in the background.

The manufacturing facilities in this country are already large enough to meet all possible requirements for the next two or three years, so that it is no loss to the general community to have a breathing spell in the matter of extension. Reports from districts adjacent to Pittsburg continue favorable to furnace men who report trade in a very healthy condition. Many furnaces have orders booked that will keep them employed for the next six months, and others that extend to a still later period, the principal orders booked being for Standard Bessemer.

Coke Smelter, Lake and Native Ore.

Table listing various iron and steel products with their respective quantities and prices.

Table listing charcoal products with their respective quantities and prices.

Table listing steel blooms, billets and slabs with their respective quantities and prices.

Table listing truck bars with their respective quantities and prices.

Table listing skip iron products with their respective quantities and prices.

Table listing blooms, beams, rail and C. ends with their respective quantities and prices.

Table listing scrap material products with their respective quantities and prices.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 2. PRODUCTION OF BITUMINOUS COAL for week ending November 26th, and year from January 1st.

Table showing coal trade statistics for Eastern and Northern Shipments, and Western Shipments, comparing 1892 weekly and yearly data with 1891 yearly data.

PRODUCTION OF COKE on line of Pennsylvania R.R. for the week ending November 26th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 99,596 tons; year 4,872,829 tons; to corresponding date in 1891, 3,968,708 tons.

Anthracite.

The investigation of the so called Reading combine, which has been in progress here and in Philadelphia, off and on, for the past week, at the hands of a Congressional Committee, has not resulted, as yet, in any very tangible facts relating to the "true inwardness" of it. Numerous officials of the companies in the combine have been examined, but nearly all of them have expressed a mournful state of ignorance concerning the vital points. They knew of the meetings of the coal sales agents, and some of them attended these meetings, but when it came to testifying as to what was done and how it affected the market they did not know. So far as these meetings go it would appear that they were held for the purpose of doing nothing that could be told. What the public want to know and what they have a right to know, and what they will know, sooner or later, is the exact nature of the compact, agreement, or tacit understanding between the several companies in the combine and the coal sales agents, and what effect, if any, it has had upon the price of anthracite coal. This, it seems to us, is a very simple matter, but it has been hedged about with so many declarations of ignorance that it is past present knowledge. It may be that there was nothing culpable in the agreement, if there was an agreement, and that the prices charged have not been in excess of a fair profit. We say this may be so, but it begins to look as if there was a "nigger in the woodpile" somewhere.

It is difficult to believe that men of more than average intelligence will come together month after month and talk over interests of such magnitude without doing something. Now, what is the something they are suspected of having done? It is the forcing of prices to a point beyond a fair remuneration. This is the sole question in which the public, as purchasers of coal, are vitally concerned. If this has been done, and until all the evidence is in we forbear to express an opinion, no condemnation can be too severe. On the other hand, if the result of the inquiry is that, taking everything into consideration, the prices of coal since the combine have not been in excess of a fair profit, we shall not hesitate to say so.

No one seems to have thought that it is the presidents and bankers who dictate the policy of the companies, and not the sales agents; and the presidents and bankers discuss the matters and dictate policies in printed interviews. The investigation is not yet finished and any opinion given at this time would be premature. We point out one very important feature of this matter, and that is, that attempts to conceal the real state of affairs will inevitably react upon the companies and the agents. The position taken by some, who are old enough to know better, reminds us of a certain colored youth who was wanted by his employer but could not be found for quite a while; finally he was secured, and on being asked what he had been doing, replied that he had been helping Bill.

"And what has Bill been doing?" "He aint a-been a-doin' nothin, Sah!"

The companies have been helping Bill, but up to this time the committee has not ascertained what Bill has been doing. A reference to Dickens may be somewhat out of place in a report on the coal market, but Pubsey & Co. seem to have opened an office in New York, and Rich, if he can be found, will have a lively time of it.

It is thought that full circular rates will be maintained throughout this month, but the combine has always had within it elements of disruption, and sooner or later they will develop just as they have in the past and turn the thing over.

No one enters the coal trade for his health or from motives of benevolence. Every miner, transporter and dealer expects to make money, and no one objects to his doing so, provided he does not trench on the rights of other people. Every combination that results in forcing people to pay more than what is fair, is iniquitous, no matter whether the intention was there or not. We hope that the true condition of affairs is not bad, but it is just as well to keep an eye on Bill.

Bituminous.

The car famine steel continues and appears to become more and more pressing. Shippers are complaining that no adequate remedy for this will be found so long as no explanation is given by the railroads. Repeated applications result in promises of improvement, but the improvement hangs fire. The railroad authorities say that they cannot move the cars; the motive force at command is insufficient, and they are powerless. Reports come to us of the storing of anthracite in cars, and this may have something to do with the lack of transportation. It should not affect those coal companies that own their own cars, but it does. A large company that owns 1,000 cars complains that it cannot get them; they go off loaded with coal to the muzzle, but the rebound is not sufficient to get them back. Charter vessels would be in demand if the coal could be got to seaboard, for the ice ports are not yet closed, and the struggle for just one more cargo would be lively. The remoteness of the mines from the coast exposes them to two serious dangers, the one coming from the domestic or home side, and the other from the foreign side. The coal has a long haul, at least 200 miles, and, in most cases, 400 miles, and nothing would operate more powerfully to encourage the importation of foreign coal than the inadequacy of the railroads to furnish rapid and regular transportation to our own miners.

If the soft coal combine, which has been alluded to in these columns, should contain within it guarantees of prompt car service, it would tend in a marked degree to further the interests of producers and consumers alike. Soft coal cannot be stored as is anthracite, for in the first place it loses in quality, and in the second place the waste from handling is too great. It must be shipped as mined, and large accumulations of soft coal stocks are practically impossible.

Charter rates are unchanged. From Philadelphia and Baltimore to Boston and Salem, 85c.; to Portland and Portsmouth, 85@90c. From Newport News and Norfolk to Boston, Salem and Portland, 80c.; to Sound ports, 70@80c.

Boston.

Dec. 1.

(From our Special Correspondent.)

Anthracite coal is quiet just at present. The retailers all have their yards well stocked and will not be able to buy until they have room to place some coal. The hearing of the Congressional committee on the coal question is interesting the trade here considerably.

Some of the dealers here would like to know how prices are going to rule next month. Some fear an advance, while others think such a thing improbable. One thing is quite sure, however, the opportunities for an advance in either December or January were never better, as there is apt to be more buying in those months than ever before. As far as the present market is concerned prices are quite firm. I hear of but little cutting by the smaller companies.

Prices on anthracite coal f. o. b. New York are: Stove, \$4.75; egg, \$4.50; chestnut, \$4.65; broken, \$4.10.

A more exasperated set of men than the commissionmen and soft-coal agents of this city would be hard to find. For over six weeks they have scarcely been able to bring a cargo of coal to this port to be shipped on the Boston & Maine Railroad from Mystic Wharf, but heavy demurrage charges have been imposed. On some vessels the demurrage charges have amounted to from \$400 to \$500. As the charges amount to 6c. per ton, and the average profit on a ton of coal is not over 5c. per ton, it can easily be seen how one day's demurrage would more than eat up a commissionman's or dealer's profit, and yet some vessels have been delayed three and four days.

It has become so bad some commissionmen will not send a vessel to Mystic Wharf where contracts are made or delivered on car basis.

The Boston Tow Boat Company has had so much experience with the B. & M. R. R. Company's Mystic Wharf piers that they absolutely refuse to charter vessels to go there. Enough care is what is needed to discharge vessels properly in their allotted number of lay days which is large allowing 150 tons discharge per day, where under favorable circumstances 250 or 300 tons could be done easily.

If the company finds that by the systematic shipment of cars it cannot take care of its coal trade, then it should have more cars. The road is notoriously deficient in rolling stock, and is seriously hampering New England's business interests by its narrow and careless policy.

It can be readily understood how soft coal under the existing circumstances is very strong. George's Creek coal on cars here is worth from \$3.60@3.65 per ton, and Clearfield from \$3.25@3.30.

Freight rates are firm all along the line, especially from Philadelphia and Baltimore. From the latter place 90c. is charged.

The yards are not doing much business at present. They have had their rush from the customary fall consumers and from this out the demand will depend on the thermometer. Prices are strongly maintained on about all kinds of coal. Retail prices are: Stove, \$6.25; nut, \$6.25; egg, \$6.00; furnace, \$5.75; Franklin, \$7.50; Lehigh furnace and egg, \$6.25.

The receipts of coal at the port of Boston for the week ending November 26th were: 30,069 tons of anthracite and 14,600 tons of bituminous, against 58,858 tons of anthracite and 6,365 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 1,893,215 tons of anthracite and 777,991 tons of bituminous against 1,876,901 tons of anthracite and 920,850 tons of bituminous for the same time last year.

Buffalo.

Dec. 1.

(From our Special Correspondent.)

In the absence of any change in demand or in prices for anthracite coal and with but few incidents worth noting this letter will be short. Bituminous coal continues in good demand with supply adequate to the requirements of the trade only.—Coke is in good demand and firm.—Shipments by lakes are nearly over for the season of 1892; for the past few days the bulk of the consignments of coal were to Chicago, the next to Milwaukee and about 10,000 tons to five other ports. Duluth freights on coal advanced 15c. and two loads were shipped at that rate; \$1 was said to be the rate for the other. There is quite a risk run in so long a journey at this time of the year.

The movement of coal westward by lake from Buffalo from November 23d to 30th, both days inclusive, aggregated 135,263 net tons, distributed about as follows: 89,850 to Chicago; 33,100 to Milwaukee; 6,563 to

Duluth; 3,500 to Toledo; 1,050 to Detroit; 800 to Bay City, and 400 to East Saginaw. The rates of freight were 75c. to Chicago; 70c. to Milwaukee; 50c. to Duluth; 90c. to Racine; 40c. to Detroit, Toledo and Saginaw, and 35c. to Bay City.

The Buffalo movement of coal by canal for four weeks in November was as follows: Receipts, 641, shipments, 240 net tons. The rates of freight, Buffalo to Syracuse 65c., and to Illion 75c. per gross ton free on and off.

The total shipment of coal from Buffalo by lake this season will aggregate at least 2,820,000 net tons; an increase over 1891 of about 500,000 net tons.

The prospects for next seasons coal business are already talked about. At Duluth and West Superior several thousand feet of new coal docks will be constructed this winter in anticipation thereof. An authority on these matters says "all that the railroads can possibly do is to furnish enough coal this winter to supply actual demands; the upper lake ports will be left bare when spring opens, and the whole northwest will then be without a pound of surplus coal."

The Duluth Chamber of Commerce has commenced anew prepare for a convention to urge the Government of the United States to construct an ocean ship canal from Lake Erie to the Hudson River.

According to the report on internal commerce of the United States for 1891 the capacity of the coal pockets at Buffalo is approximately 36,800 tons, and the daily shipping capacity 27,500 tons. In addition to this the stocking trestles have a capacity of about 725,000 tons.

The evidence on the "Reading combine" matter is the topic of discussion among all interested in the coal trade. Presume you will give the details of the examination.

Chicago. Dec. 1.

(From our Special Correspondent.)

To day practically closes general lake navigation for the sailing vessels and a very large proportion of the coal-carrying steamers, so that for all further supplies shippers will have to depend on the railroads. It is an excellent thing that stocks here are large, as the chances at present for all-rail coal shipments of any moment are somewhat precarious. Chestnut continues in good demand from outside country points and some shippers claim that although "all-rail" is in better supply, it is not coming forward fast enough to supply the trade demand, except on the larger sizes. Some of the large jobbers and agents are still very much behind on their order for the smaller sizes, principally chestnut. Shippers are looking forward to a fair volume of business all through the winter, and well into next spring, basing their opinion largely on the fact, that western and north western country dealers have bought according to the actual demands made upon them for anthracite coal, without reference to future requirements. Of course demand will, to a very large extent, depend upon weather conditions. Wholesale prices are now well maintained, and shippers state there is no inducement to shade the circular. Retail coal continues in good demand, and is mainly confined to chestnut and range in lots of from one to five tons, the regular price being \$7.25, though that is shaded according to circumstances, size of order, etc.

Bituminous coal, as we predicted in a modest way some weeks ago, has never been in so prosperous a condition as at the present time. The demand for this coal of every variety and quality is unprecedentedly large and prices are very remunerative. Sales are only limited by the amount that the shippers and dealers are able to deliver and it makes some of them "weep and gnash their teeth" to be obliged to turn away very large orders offered at most profitable prices. Not only is this true of this section but from all quarters of the bituminous regions we have the same reports of the unequalled demand, good prices and inability to fill one-half of the business tendered.

The railroads, owing to the continued mild weather, are moving the heavy grain crops with every prospect for this class of traffic continuing for at least another month. Their own requirements for coal for locomotive purposes have increased from 50 to 100% and is taxing the resources of contractors to the utmost to satisfy them, who in many cases fail, as there is not a western road outside of Chicago which is not more or less short of fuel. The almost universal strike, or rather "lockout," in the Peoria district and the decreased production in Iowa, have thrown nearly all this additional business on to Indiana, Ohio and Illinois coal fields, while the scarcity of cars, the customary dissatisfaction among miners when trade is good leave the dealers in poor shape to meet the wonderfully increased trade which has developed in these western states. It will require mild weather during December and uninterrupted railroad facilities for the operators in this sections to catch up with the orders they now have on hand, and to prevent great suffering throughout the West and Northwest.

Coke of Connellsville make for foundry use is in fair demand and price remains steady. Crushed domestic from the same region continues to make headway here, and the outlook is satisfactory to shippers and dealers in this modern substitute for anthracite.

Quotations are: \$4.65 furnace; \$5.05 foundry; crushed, \$5.40 Connellsville; West Virginia, \$3.90 furnace, \$4.10 foundry; New River foundry, \$4.75; Walston, \$4.65 furnace, \$5 foundry.

Circular prices are at the following rates: Lehigh lump, \$6.50; large egg, \$5.85; small egg, range and

chestnut, \$6.10. Retail prices per ton are: Large egg, \$7.25; small egg, range and chestnut, \$7.25.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.40; Hocking Valley, \$3.20; Youghiogheny, \$3.25; Illinois block, \$1.90@\$.2; Brazil block, \$2.60@\$.2.75.

Pittsburg. Dec. 1.

(From our Special Correspondent.)

Coal.—The reports from the Monongahela mining regions are very conflicting. One day comes the report that everything is arranged, that work will be resumed at 2½ for mining in the fourth pool and 3 cents in the other three pools; next comes the report that the expected break did not occur, that no miners are at work at 3 cents. The supply of coal in the lower markets is said to be ample, and the general calculation is that there is coal enough there to last until April without inconvenience to any one.

At a meeting at the Coal Exchange, representatives of Messrs. J. Walton & Co., O'Neill & Co., Hivner and Roberts, Addison Lysle, Jenkins & Co., and other coal firms declared that they will not start their mines except at a 3-cent rate if they remain idle all winter. Reliable information seems almost impossible to obtain in regard to the Monogahela region, about 200 miners working at 3 cents distributed at various mines. Some 150 miners are loading flats for retail purposes at 3½ cents, the balance of the miners are still out. Lake shipments have ended.

Connellsville Coke.—A slight falling off has occurred in the production and shipment; the latter was caused by the scarcity of transportation. Production will not vary much the balance of the year; there is considerable stock coke in the yards. The eastern shipments were especially short, dropping off over 200 cars. There is a larger demand for foundry and crushed coke than ever before; the latter is rapidly gaining in favor as a fuel for family use and a good business may be built up with it as a substitute for anthracite. The output shows 13,480 ovens in blast and 3,773 idle, with a total estimated production of 126,584 tons. Week's shipments: To Pittsburg, 2,000 cars; points east of Pittsburg, 1,000 cars; points west of Pittsburg, 3,500 cars; total, 6,500 cars. Western shipments increased 30 cars; Eastern shipments decreased 349 cars, and Pittsburg shipments, 100 cars, a total decrease of 419 cars. Prices unchanged.

CHEMICALS AND MINERALS.

New York, Friday Evening, Dec. 2, 1892.

Heavy Chemicals.—This market is very quiet and unchanged from last week. There has been some demand for high test alkali for shipments in 1893, and it has been offered in large lots for future delivery at prices somewhat below the last week's figures. Carbonated soda ash is very quiet, as is also caustic soda. American sal soda is lower this week, the result, it is said, of certain speculative sellers. Bleaching powder for spot delivery is without features of interest, the demand for it being light. For future delivery, however, considerable business has been done during the week.

Our quotations to-day are as follows: Caustic soda, 60%, 3-17½@3-27½c.; 70%, 2-95@3-12½c.; 74%, 2-97½@3-15c.; 76%, 3-12½@3-25c.; 77%, 3-12½@3-25c. Carbonated soda ash, 48%, 1-57½@1-60c.; 58%, 1-47½@1-52½c. Alkali, 48%, 1-50@1-55c.; 58%, 1-40@1-50c. Sal soda, English, 1@1-05c.; American, .95@1c.; on the spot shipments, in quantities, .97½@1c.; for English and .90@.95c. for American; bleaching powder, 2-40@2-6c.

Acids.—In nowise is the acid market changed from our last report. Business is very good, the demand being, as we stated last week, above the average for this time of the year. There is some scarcity of acid, but prices show no change of importance. We quote this week: Acid, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, \$1.60@\$.2, according to quality; muriatic, 18", \$1@\$.1.25; 20", .90c.@\$.1.10; 22", \$1.25@\$.1.50; nitric, 40", \$4; 42", \$4.50@\$.4.75; sulphuric, 85c.@\$.1.10; mixed acids, according to mixture; oxalic, \$6.50@\$.7.25. Blue vitriol is quoted all the way from \$3.25@\$.3.75; Glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—The market for brimstone shows no change, either in prices or in general features. We quote this week: On the spot, best unmixed seconds, \$25; best unmixed thirds, \$24@\$.24.25. To arrive, near due, \$24 for second and from 75c. to \$1 less for thirds. Future shipments, \$20@\$.20.50 for best unmixed seconds and \$19@\$.19.50 for thirds.

Fertilizing Chemicals.—A fairly good business has been done in fertilizers during the week. The demand keeps up, especially from the South. Due to this and to a continued scarcity, the prices of some of the ammoniates show an advance. Our quotations this week are as follows: Sulphate of ammonia, \$2.90 @\$.2.95 for bone goods and \$2.95 @\$.3 for gas liquor. Dried blood, \$2.37½@\$.2.40 per unit for high grade and \$2.30@\$.2.35 for low grade; acidulated fish scrap, no stocks on hand; dried scrap, \$25; Azotine, \$2.30. Tankage, high grade, \$23.50@\$.24; low grade, \$20@\$.22, according to grade. Bone tankage, \$22.50@\$.23.50; bone meal, \$23.50@\$.25.50.

Double manure salts are unchanged. The price has been fixed by the syndicate's agents, and has not changed during the year. Quotations are as

follows: \$1.13½ cwt., basis 48@50%, in 50 ton lots, on foreign weights and analysis. High grade sulphate, \$2.13 cwt. basis 90%, foreign weights and tests.

Phosphates.—Phosphate rock, Florida, 60@90%, is quoted from Punta Gorda at \$4.50 per ton of 2,240 lbs. Charleston rock is quoted at \$4.50@\$.5 f. o. b. Charleston. A dispatch from Columbia, S. C., states that in his annual report on the condition of phosphate beds in South Carolina, Governor Tillman, as chairman of the Board of Commissioners, says the present condition of the phosphate trade is very unsettled and the market is glutted. Florida rock is displacing ours, he says, and forcing the price down till the margin of profit is very small, and with some companies may have disappeared altogether. He adds: "It is almost certain that this Florida competition will prove very formidable, and may necessitate concessions to our miners on the part of the State. We are not at present prepared to recommend any reduction in royalty, but it may become absolutely necessary before long. The outlook is far from encouraging, but we hope that as soon as Florida miners shall have unloaded their rock on the market, prices will so far advance as to enable our miners to continue business at a profit."

Kainit.—There is nothing of interest to report of Kainit. Prices continue as follows: \$8.75 for invoice weight and \$9 for actual weight, New York and Philadelphia; Southern ports \$1 higher.

Muriate of Potash.—There is no change in the position of this salt. Arrivals during the week aggregated 475 tons. New sales were 100 tons for future shipments. Prices are: For 50 tons or over, New York or Boston, \$1.81½; Philadelphia or Baltimore, \$1.84; Southern ports, \$1.86½.

Nitrate of Soda.—The market for nitrate is quiet. Stocks in store are lighter than they have been for years; there are only about 14,000 bags here. Quotations are: Spot, \$2.15; to arrive, according to position, \$1.95@\$.2.10.

Liverpool. Nov. 23.

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

There is nothing of any moment to report in the position of our market for heavy chemicals, transactions reported being on a retail scale. Soda ash scarce for the balance of this year, and the Union decline to quote except for retail lots. Quotations are nominally as follows:

Caustic ash, 48 % £5 6s. 3d. per ton and upwards; 57@58 % £6 7s. 6d. per ton and upwards; Carb ash, 48 % £5 7s. 6d. per ton and upwards; 58 % £6 10s. per ton and upwards; Ammonia ash, 58 % £6 7s. 6d. all net cash.

For 1893 deliveries, values are about 10% to 15% per ton, under spot quotations, but the Union decline to quote at present at this side for American orders.

Soda crystals are dull @ £3 3s. 9d. to £3 5s. per ton, less 5%.

Caustic soda is quite neglected, although prices remain nominally unchanged as follows: 60%, £9 2s. 6d. per ton; 70%, £10 5s.; 74%, £11, 5s.; 76%, £12 2s. 6d. and upward, all net cash. For parcels under 10 tons 5s. per ton extra is charged. For contracts over 1893 quotations ranged from 10% to 20% per ton under spot values according to market.

Bleaching powder is very quiet and prices nominally about £7 12s. 6d.@£7 15s. per ton net cash for hardwood casks, while a reduction would be taken for contracts over 1893.

Chlorate of potash scarce and less inquired for. On the spot 8½d. per pound is nearest value and 8½d. for December. The syndicate report being fully sold for the first three months of 1893, and quote 7d. for April and December delivery.

Sulphate of ammonia is rather better, and nearest values are £10 7s. 6d.@£10 8s. 9d. per ton for good grey 14% and £10 10s.@£10 11s. 3d. per ton for 25%, both in double bags, less 2½%, f. o. b. here.

Nitrate of soda steady at £9 5s.@£9 7s. 6d. per ton less 2½% in double bags, f. o. b. here.

Bi-carb. soda is not active, but price is steady at £6 15s. per ton, less 2½% for one cwt. kegs, with usual allowances for larger packages.

Carb. ammonia held for 3d. per lb. for lump, and 3½d. per lb. for powdered.

Messrs. Couper, Millar & Co., of London, Eng., in their monthly report of the fertilizer market of the United Kingdom, say under date of November 16th inst: "Such a long spell of depression we never remember, and it is not easy to forecast the future. Certainly there has been a little more inquiry lately, but prices are cut so low, no margin is left for profit. As to the phosphate market, the insane competition between the South Carolina and Florida raisers continues, and it looks as if the Charles town men imagine they can wipe out their neighbors, which, with quality approved all over Europe and quantity unlimited, is simply an impossibility; far better for all interested if some combination could be arrived at by which prices could be advanced and maintained steadily at a paying figure. Mineral Phosphates—Canadian Phosphate; shipping season over. South Carolina has been sold at 6d. per unit and is still offering thereat.

Florida Hard Rock 75% offered at 8d.@8½d, while River Pebble 60% is held for 7d., and Land Pebble testing about 68% would come at same figure. Ground Somme depressed 10d. for 70% and 11d. for 75%, basis c. i. f. London, would mean business.

Ground Belgian steady at about 5d. per unit, f. o. b.

Osso we hear of no sales in U. K. Cambridge and Bedford Coprolites, in our opinion, cannot be raised to pay.

NEW YORK MINING STOCKS QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, listing various mines and their prices from Nov. 25 to Dec. 2, 1892.

\*Ex-dividend. †Dealt at in New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 2,957 Non-dividend shares sold, 3,330. Total shares sold, 21,257.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing various mines and their prices from Nov. 25 to Dec. 1, 1892.

Dividend shares sold, 11,600. Non-dividend shares sold, 8,817. Total shares sold, 20,677.

DIVIDEND-PAYING MINES

NON-DIVIDEND PAYING MINES

Detailed table of mining stock data, including company names, capital stock, shares, assessments, and dividends for both dividend-paying and non-dividend-paying mines.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

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

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. \* Non-assessable. † Paid on the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Cons. Virginia \$42,90,000. \*\* Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before the reorganization in 1880. ††† This company acquired the property of the Raymond & Kly Company which had paid \$3,075,000 in dividends. †††† Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$425,000 in assessments.

STOCK MARKET QUOTATIONS.

Baltimore, Md. Nov. 30.

Table with columns: COMPANY, Bid, Asked. Includes entries for Atlantic Coal, Balt. & N. C., Conrad Hill, Cons. Coal, etc.

Denver.

Table with columns: COMPANY, High, Low, Sales. Includes entries for Anaconda, Amity, Claudia J., etc.

Prices and sales for the week ending November 26th:

Table with columns: COMPANY, H, L. Includes entries for Bridgewater Gas Co., Chartiers Val. Gas, etc.

Pittsburg, Pa.

Prices highest and lowest for the week ending December 1st:

Table with columns: COMPANY, H, L. Includes entries for Bridgewater Gas Co., Chartiers Val. Gas, etc.

St. Louis.

The closing quotations were as follows:

Table with columns: COMPANY, Bid, Asked. Includes entries for Adams, American & Nettie, etc.

Deadwood.

The closing quotations were as follows:

Table with columns: COMPANY, Bid, Asked. Includes entries for Axiom, Carthage, Golden Reward, etc.

Colorado Springs, Colo. Nov. 26.

Table with columns: COMPANY, Bid, Asked. Includes entries for Anaconda Gold, Argentum-Junata, etc.

Foreign Quotations.

London. Nov. 19.

Table with columns: Highest, Lowest. Includes entries for Alaska Treadwell, Amador, American Belle, etc.

Paris. Nov. 10.

Table with columns: Francs. Includes entries for East Oregon Ore, Golden River, etc.

San Francisco, Cal.

Table with columns: NAMES OF STOCKS, Nov. 25, Nov. 26, Nov. 27, Nov. 28, Nov. 29, Nov. 30, Dec. 1, Dec. 2. Includes entries for Alpha, Alia, Belle Isle, etc.

\* No quotations on account of telegraph.

CURRENT PRICES.

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

Large table listing various commodities and their prices, including Acid, Alcohol, Alum, Ammonia, Asbestos, Ashes, Asphaltum, Barium, Bauxite, etc.

Powdered, etc.

Table listing powdered and other refined materials like Marble Dust, Metallic Paint, Mineral Wool, etc.

THE RARER METALS.

Table listing rarer metals and their prices, including Aluminum, Arsenic, Barium, Bismuth, Cadmium, etc.

COAL STOCKS.

Table with columns: NAME OF COMPANY, Nov. 26, Nov. 28, Nov. 29, Nov. 30, D. c. 1, Dec. 2, Sales. Includes entries for Cambria Iron, Col. C. & I., etc.

Total shares sold, 461,099.