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CONTENTS.

IT is stated that there is a movement on foot to amend the mining laws of the State of New York so as to permit shares of mining organizations to be assessed.

AT a meeting of the Submarine Continental Railroad Company, at the Charing Cross Hotel, as reported in the London *Times*, Sir E. W. WATKIN made the startling statement that "there are already 58,000 miles of underground tramway and roadway in the mines of Great Britain."

THE following officers of the American Institute of Mining Engineers were elected for the ensuing year: President, Richard P. Rothwell; Vice-Presidents, T. N. Ely, C. Macdonald, J. W. Powell; Managers, W. Burnham, Anton Eilers, A. S. McCreath; Treasurer, T. D. Rand; Secretary, Thomas M. Drown.

ENGLISH engineers are discussing the possibility of driving a tunnel under the Channel, and whether it can be used if it should be finished. Colonel BEAUMONT asserts, from experience with a boring-machine which takes out the full face, that he can make a specified progress, the compressed air to work the machine being used for ventilation. The *Engineer*, among other pertinent questions, asks how he is going to carry compressed air ten miles, or what power it will take to force it through the mains.

IN France, coal was mined as early as 1321 at Roche-la-Molière in the Loire Valley. In the sixteenth century, mining for coal was started at Brassac and Grand-Combe. Toward the close of the seventeenth, the Decize mines were opened, and in 1720, Count DÉSANDROINS discovered coal at Fresnes, and later, in 1734, at Anzin. The Anzin Company is now the largest in France, producing about two millions of tons annually and employing 15,000 men. The first steam-engine to pump water was introduced in 1732.

HIS ROYAL HIGHNESS, the Sultan of Zanzibar, has some peculiar notions concerning the powers of geologists. Following the example of the heads of more enlightened communities, the Sultan appointed a young Englishman as geologist to look for coal in his domains. The Sultan's state geologist after a few months' search failed to find any, and has been summarily dismissed for incapacity, his Royal Highness evidently laboring under the impression that a geologist ought to discover coal whether it was there or not. The sultan differs only in degree from some of our own enlightened legislators.

THE Germans continue to devote much close study to the theoretical features of the basic Bessemer process, and they are gradually bringing out many features of great practical interest. EHRENWERTH was the first to announce, as the result of a purely theoretical process of reasoning, that phosphorus could replace silicon for the generation of the necessary heat to conduct the process to a close, and seemed inclined to believe that there was no danger of an excess. Dr. MUELLER, however, has called attention to the fact that, if the percentage of phosphorus in the pig is too high, the temperature is unduly increased toward the close of the blow, and causes a very serious and costly waste of iron. When the pig is run into the converter hot, and when it holds 0·5 per cent of silicon, the percentage of phosphorus should not, according to Dr. MUELLER, go beyond 1 to 1·25 per cent. The requirements of the basic process are worked out very thoroughly, and American steel-makers, when they do commence to use it, will find a mass of valuable material to guide them in their first efforts.

AN elaborate argument was made recently before the House Committee on Coinage, Weights, and Measures by Mr. WALDO HUTCHINS, of this city, in favor of establishing the United States Mint in this city instead of enlarging that at Philadelphia. He called attention to the fact that the sale of the Assay Office property in Wall street and the Mint property in Philadelphia would realize a sum not less than $1,600,000, which would be more than ample to move the machinery from Philadelphia, and add new appliances fully capable of meeting present requirements. It is urged by him in behalf of this plan that, by erecting the buildings on Governor's Island, where there is enough room, the treasures would be much more efficiently and cheaply guarded, and that the saving in express charges on bullion and specie would be very large annually. The latter point is one which deserves particular consideration, as it not only affects the government, but private individuals also. The bullion from the West naturally comes to this city first, and must then be transported to Philadelphia, a tax amounting to about one per mille. It is estimated by Mr. HUTCHINS that in two and a half years this item has amounted to $134,000 to the government alone.

DURING a discussion of a number of points connected with the manufacture and the use of nitro-glycerine compounds before an Austrian society of engineers, a representative of the manufacturing interests made some interesting statements. It was asked whether it was possible to produce explosives having a specified guaranteed percentage of nitro-glycerine, and the reply was elicited that, so far as blasting gelatine was concerned, such a guarantee could be made. With those explosives, however, in which the nitro-glycerine was taken up by some absorbent, variations of one half to one per cent might occur in the cartridges of one lot. It was argued, however, that the percentage of nitro-glycerine has not as much importance as is generally attributed to it, and that a poorer compound might, under certain circumstances, be more effective than another richer in nitro-glycerine. It is claimed by men whose experience entitles their opinions to consideration that the position, depth, and diameter of the hole and the hight of the charge and the way in which it is fired have more influence upon the effect of a shot than the percentage of nitro-glycerine. It seems, too, that the nature of the absorbent tells largely on the effect.

MINING TITLES IN MONTANA.

The case of HAUSWIRTH *against* BUTCHER, decided last month in the Supreme Court of Montana, involved an interesting point in construction of the Act of 1872. That act provides that a lode claim "shall not exceed 1500 feet in length along the vein or lode." This is also the language of Section 2320 of the Revised Statutes. One of the parties in this case claimed title under a certain location which was, on one side, 2000 feet long. We infer from the opinion before us that this location, though admitted to be unauthorized by law as to the whole 2000 feet, was good

for 1500 feet of its length. This point, Chief-Justice WADE, the other justices concurring, decided as follows (we quote from a Montana exchange):

"Before there can be a valid location, there must be a discovery. Taking the discovery as the initial point, the boundaries must be so definite and certain that they can be readily traced, and they must be within the limits authorized by law. Otherwise, their purpose and object would be defeated. The area bounded by a location must be within the limits of the grant. No one would be required to look outside of such limits for the boundaries of a location. Boundaries beyond the maximum extent of location would not impart notice, and would be equivalent to no boundaries at all. A discovery entitles the person making the same to a mining claim embracing the discovery, not to exceed 1500 feet in length by 600 feet in width. Within these limits, if the boundaries are properly marked on the ground and the location properly made and recorded, the grant of the government attaches, and the third person must take notice. But they would not be required to look for stakes or boundaries outside of or beyond the utmost limits of a location as authorized by the statute. As to the length of a mining claim, there must be a substantial compliance with the law, as there must in all other respects pertaining to the location. The claim in question, as is shown by the stakes and boundaries thereof, is two thousand feet in length, whereas the greatest length as authorized by the law is fifteen hundred feet. *If such a location could be sustained to the extent of 1500 feet where the rights of third persons had not intervened, which we do not decide, certainly, if such right had attached, such a location would not protect five hundred feet of length in claim more than the law authorizes by virtue of one discovery.* A 1500-foot claim can not be shifted from one end to the other of a 2000-foot claim, as circumstances might require, to cover the discovery of a third person, within such 2000-foot claim."

This decision appears to us to be beyond a doubt correct. That it is equitable, a little reflection will show. The United States parts with its mineral lands on terms of unprecedented liberality. Scarcely any restrictions are laid upon the mining locator, except such as are necessary to secure an equal liberty to other citizens, by defining precisely the extent of the rights and privileges granted away. The least that the miner can do, in accepting the generosity of the government, is to abide by its terms, and so define his claim that later comers may not be prevented from availing themselves of the same generosity, and acquiring property not already conveyed to him. Nothing would be really more oppressive or unjust than to permit, under the mining law, a procedure analogous to the "floating grants" of Spanish practice.

The passage we have italicized above disclaims the intention of deciding whether an excessive location would be wholly invalid if the rights of third parties had not intervened. The disclaimer is not very important; since the United States, as owner of the mineral lands, raises no question of title against their occupiers while they do their "assessment-work." But since the "rights of third parties" would intervene very promptly in such a case, if the property were worth "jumping," it behooves the locators of Montana to look carefully to the boundaries of their claims, and make sure that they are within the limits set by law. We have reason to suspect that they have been somewhat careless in this respect—as men are apt to be, when carelessness seems likely to prove subsequently advantageous. A preliminary location survey, such as is now made in the Black Hills and other districts, under local laws, is not a bad thing. But we do not think the courts would be harsh in enforcing the principle of the above decision in a case where, by reason of rude measurement, in the absence of an instrumental survey, a slight error had occurred in the original location. To lay out a claim of 2000 feet, with the view of claiming any 1500 feet of it that might prove most advantageous in mining or in litigation, is quite another matter. The quicker that sort of business is suppressed, the better for honest miners and prospectors. *

THE USE OF THE ANEROID.*

Prof. G. W. PLYMPTON has issued a new edition of his excellent little manual on the aneroid barometer, which we can heartily recommend. The merits of the book being well known already, we notice only a few changes which have been made, and all of which we regard as improvements. The division of the book into chapters, and the addition of a table of contents, are not the least welcome of these changes. There is a new chapter, containing illustrated descriptions of all the leading forms of aneroid barometers. The tables have been reinforced with a new one given in millimeters, and also one showing the boiling-point at different pressures. To show the use of the tables, a number of examples are worked out. On the other hand, many of the more elementary and unnecessary statements and examples of the old edition have been omitted, to make room for this better material. A few blank leaves at the end, properly ruled for barometric field-notes, complete the convenience of the book as a pocket-manual. *

THE WASHINGTON MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

THE FIRST SESSION.

The first session of the Institute was held at the National Museum Building, adjacent to the Smithsonian Institution, on Tuesday, February 21st, an unusually large number of members from all sections of the country being present. Mr. William Metcalf, President of the Institute, introduced Gen. William T. Sherman, who addressed the meeting in behalf of the Regents of the Smithsonian Institution. He outlined briefly the growth of the mining industry as revealed by the figures of the Census Bureau, and related how he had seen the working of the New Almaden mine in 1847; how he had followed the development of the gold mining industry from the pan to the stamp-mill; how he had descended into the Lake Superior copper mines; how he had watched the processes at Black Hawk, Colo.; and how he had gone into the deep mines of Nevada. He urged upon the engineers the necessity of keeping abreast of progress.

Major J. W. Powell, Director of the U. S. Geological Survey and Chairman of the Local Committee of Arrangements, dwelt upon the intimate relations between the work of the geological survey and that of the mining profession, and as an instance of the way the survey co-operated with the mining industry, he stated that the U. S. Geological Survey was now preparing a report on the famous Comstock lode; another on the Eureka District, Nevada; another on the Leadville region; and one on the Lake Superior copper district. Major Powell dwelt on the importance of the work of the Institute, and the great share which technology has had in aiding and directing progress and civilization during the present century.

Mr. William Metcalf, in behalf of the Institute, in a few happily chosen words, thanked General Sherman and Major Powell, and called upon the Secretary to read the list of candidates for membership, who were duly elected.

In the evening, the members and their ladies were entertained by a reception tendered by Mr. and Mrs. Powell.

SECOND SESSION.

The first paper read was by E. F. Loiseau, of Philadelphia, on a process for making artificial fuel from anthracite and bituminous coal-dust, and the applicability of the process to the utilization and solidification of the slacking lignites of the West. He sketched the past history of the Loiseau process, the details of which have been fully published, and announced that now compressed anthracite dust-fuel was made successfully and commercially at Port Richmond, Pa., by the Loiseau Fuel Company. Mr. Loiseau proposes to construct the presses so as to produce lumps of egg shape, but of different sizes, weighing from two ounces to two pounds each. Small machines will be devised to manufacture from 25 to 60 tons per day, for the accommodation of coal operators. Mr. Loiseau, after a description of the various grades of lignites, urged that the process which had proved successful with anthracite dust would be of especial importance for the lignites of the West. He claimed that by pressing the lignite into regular egg-shaped masses with the necessary cementing materials, he could prevent expansion, slacking, and spontaneous combustion which so rapidly render lignite unfit for use.

Mr. William H Adams presented a paper on the Coals in the Santa Rosa District, Northern Mexico, to which Mr. Adams has referred in letters to the ENGINEERING AND MINING JOURNAL. In the district are found vertical veins of semi-anthracite, which Mr. Adams had opened to a depth of 240 feet. Coal of a semi-bituminous nature is found outcropping on the rivers 30, 40, and 60 miles to the eastward, and lignites in many places over a wide range of country drained by the Rio Grande. Surface openings at several points along the Sabinas River above ordinary water-level show veins of coal of good workable thickness and excellent quality. The amount of sulphur in it is considerable and finely disseminated, but not so great as to require a washing operation. Passing farther to the east, openings have been made about Eagle Pass in a circuit of 20 miles in Mexico, and notably at the mouth of Sico Creek. At Eagle Pass and several points of the Rio Grande River the classes of coal change, and lower grades of bituminous coal and shales are found in wide veins, but so mixed with clay and grit as to be of little value commercially so far as yet developed. These Mr. Adams is inclined to believe Permian. Down the river, more recent formations crop out; and in the neighborhood of San Antonio, the true brown coals are found. The future commercial value of this basin of coal, Mr. Adams says that the metallurgists and railroads must determine hereafter. On the upheaved veins, the coal cokes easily, producing about 60 per cent in weight of good coke. Extended underground work and the results of a new bank of 50 ovens to be erected in the spring will give a practical demonstration.

After a brief discussion, Mr. J. C. F. Randolph, of New York, was called upon to read his paper on the new mill at Batopilas, Mexico, which we shall present in full at a future date. It was followed by a record of experiments made by Mr. Henry M. Howe on the comparative efficiency of fans and positive blowers, a subject which is of such importance to our readers that we shall return to it at greater length. This paper led to considerable discussion, in which Mr. Shinn, Mr. P. Roberts, Mr. W. P. Ward, Mr. Frazier, Mr. N. S. Keith, and others participated.

Mr. C. Henry Roney, of Philadelphia, described the Thompson pulverizer, introduced in this country in a somewhat modified form by Mr. S. M. Tasker, and which has been fully illustrated and described in the ENGINEERING AND MINING JOURNAL.

THE HOLLEY MEMORIAL SESSION.

On Wednesday afternoon, a special session was held in memory of the late Alexander Lyman Holley. President Metcalf, in a few well-chosen words, stated the object of the meeting, and called Dr. R. W. Raymond to the chair. In succession, Mr. William Metcalf, of Pittsburg; Dr. R. W. Raymond, of New York; Dr. T. Sterry Hunt, of Boston; Hon. A. S. Hewitt, of New York; W. P. Shinn, of New York, Ex-Presidents of the Institute; Ashbel Welch, President Society Civil Engineers, of Philadelphia; E. D. Leavitt, Jr., of Boston; Captain Dutton; R. W. Hunt, of Troy; Prof. T. Egleston, of New York; G. W. Maynard, of New York; E. T. Clarke, Martin Coryell, of Lambertville, N. J.; J. A. Ricketson, of Pittsburg; A. C. Holloway, O. Chanute, and C. Macdonald, of New York, paid eloquent tributes to the memory of deceased. Disaptches were read from E. P. Martin, of Blaenavon, England; E. Windsor Richards, of Middlesbrough, England; C. Snelus, Cumberland, England; S. G. Thomas, London; the Council of the British Institute of Civil Engineers; Mr. Schneider, of Creusot, France; M. Greiner, of Seraing, Belgium; A. Langdon, of Krupp's works, Essen, Germany; R. Akerman, Stockholm, Sweden; and P. Sandberg, of London, England. Letters had been received from W. R. Jones, of Pittsburg; E. C. Pechin, of Cleveland; W. H. Taylor

* *The Aneroid Barometer: Its Construction and Use.* Second Edition, Revised and Enlarged. New York: D. Van Nostrand. 1881. 12mo, 126 pages.

J. Smith, E. B. Coxe, of Reading; P. Barnes, J. C. Baylis, of New York; Professor Smock, and Mr. Congrave.

Mr. Joseph D. Weeks, of Pittsburg, offered the following resolutions, which were unanimously adopted:

Resolved, That in the death of Alexander Lyman Holley, formerly President of the Institute, we mourn the departure, not only of a great inventor and engineer, pioneer in the applications of science, and benefactor of mankind, but also and more keenly, of a true comrade and dear friend, the memory of whose strong and gentle spirit is indissolubly blended with the social history of this organization, as his genius, enthusiasm, and activity were potent factors in its professional success.

Resolved, That the chairman of this meeting be requested to deliver on some suitable future occasion an address in commemoration of the life and life-work of Mr. Holley.

Resolved, That the Council of the Institute be requested to take into consideration the publication of a memorial volume, to contain the above-mentioned address, the proceedings of this meeting, and such other matters as may be deemed expedient.

Resolved, That we extend to the American Society of Civil Engineers and to the American Institute of Mechanical Engineers our sympathy in this great loss, sustained by them as well as ourselves.

Resolved, That a committee of five be appointed to take charge, after consultation with the Council, and in co-operation with such similar committees as may be constituted by our two sister societies, of the execution of the measures proposed in these resolutions, and to represent the American Institute of Mining Engineers in any further proceedings that may be taken for the same purpose.

Resolved, That a copy of these resolutions, together with the assurance of our profound sympathy, be transmitted by the secretary to the family of Mr. Holley, and that copies be sent also to the secretaries of the American Institute of Mechanical Engineers and the American Society of Civil Engineers.

Dr. Raymond accepted the task of preparing a memorial paper, and read a letter from Mr. Holley to him, written in 1876, and a communication from Mrs. Holley to the American Institute of Mining Engineers.

THE FOURTH SESSION

The evening session was devoted entirely to a subject which is likely to engage the attention not alone of engineers of all branches of the profession, but also manufacturers and the public in general. On the 17th of June, 1881, the American Society of Civil Engineers appointed a committee, consisting of Messrs. T. Egleston, William Metcalf, A. P. Boller, T. C. Clarke, and F. Collingwood, to "examine further into the subject of tests of iron, steel, and other metals." At the meeting of January 17th, 1882, this committee reported in favor of carrying forward the work of making chemical and physical experiments either by a civil commission alone or by a civil commission associated with the officers representing the Engineering Corps both of the army and navy, carried on under government auspices. The committee was of the opinion that the commission to be appointed by the President of the United States should be composed either of ten civil engineers or of five civil engineers and five officers of the Staff Department of the Army and Navy. The committee suggested that the commission employ all the necessary assistance for carrying out the work, and to arrange in general how tests are to be made. This report led to a very long discussion, in which it was urged that the commission ought not to superintend but to make the tests, that the members of the commission should be paid, that the commission should not report to one department of the government but to the President or to Congress directly. It was urged that the adoption of these modifications would endanger the passage of a bill providing for the appropriations for the purposes of the commissions. It was finally resolved that the report of the board of direction be authorized to memorialize Congress and to promote, so far as it can be done without incurring expense, the introduction and framing of a law adequate to resume the investigation into the strength of structures and the parts and materials of which they are composed.

Mr. Ashbel Welch, President of the American Society of Civil Engineers, stated the object of what may be termed a joint conference, namely, asking Congress to authorize the appointment of a commission whose power and duty it should be to test materials used in heavy structures and the members of structures themselves in the sizes and forms used.

Mr. Charles Macdonald outlined the history of the agitation. In 1872, the American Society of Civil Engineers resolved that a committee of five be appointed to make tests. Congress, on November 4th, 1875, appointed such a commission, consisting of Colonel Laidley, Commander Beardslee, General Gillmore, Captain David Smith, Professor R. H. Thurston, Alexander L. Holley, and General William Sooy Smith. An appropriation of $75,000 was made, and a testing-machine was completed, the building of which by A. H. Emery, C.E., took so much money and consumed so much time that the appropriation was exhausted and hampered the work of the Board. The latter did much work independently, covering investigations on the relation of chemical composition upon the useful properties of iron and steel, the reheating and rolling of iron, chain cables, welding of iron, copper and tin alloys, etc.

Mr. Macdonald, as an instance of the importance of the work of testing with the Watertown machine, stated that during the last year 80,000 tons of iron and steel were used in building about 50 miles, the safety of which depends upon the knowledge of the strength of members. About 85 per cent are members subject to compressive strains, the experimental data on the strength of which are very limited and are erroneous. The recent fall of a prominent bridge in this country would probably not have occurred if the strength of its full-sized members had been known to its contractors. So far as tension members are concerned, it is assumed that those of larger section are capable of resisting the same stress as specimens of smaller section experimented with in small testing machines.

It is estimated that 50,000 tons of rolled beams are annually used in the floors of buildings, and to a more limited extent as stringers in bridges. The only experiments upon which the formulæ which serve as the basis for the determination of the size of floor beams are based were made abroad on foreign materials, and the flexure of which should be determined. It is asked why bridge builders do not use steel more; the answer is, that our knowledge of the behavior of structural steel is so limited as to render its employment on a large scale difficult.

The assistance of the general government is asked because there is no prospect that the necessary information will be obtained by private enterprise, because private individuals would not give the public the benefit of their experience, and would not be received by the public with that confidence which the results by impartial investigators would command. The users of iron and steel have claims upon the general government to ask its aid. It has now a testing machine, which is now made to meet the demands of private individuals. It took 7½ days to make tests of 9 bridge members, making the cost per bar $15. It is comparatively idle, because the staff is not large enough. Manufacturers, builders, and engineers would accept the results of government tests. Mr. Macdonald, in conclusion, favored as most satisfactory the appointment of a special commission.

General Meigs concurred in the remarks made by Mr. Macdonald concerning the importance of having tests of structural iron, and stated that probably the government was the largest single consumer, and would probably put up one hundred public buildings in one hundred different cities in the country during the coming year. In all of them, iron and steel are used in many forms; and as the cost depends upon the size and dimensions, which in turn depend upon the coefficient of safety, a great saving could be made in the materials used, if there was accurate information upon the coefficient of safety.

Captain Lyle, of the Ordnance Department, spoke of his experience of the unreliability of ordinary testing-machines as applied to the solution of problems in the manufacture of small arms. The Ordnance Department had little chance to use the Watertown machines, the work for private parties taking precedence. He had a letter of recent date, from the man in charge of the machine to the Chief of Ordnance, in which it was stated that the maximum amount of work done by the machine in a day of 8½ hours was 70 tests, the minimum being one test in two days. The cost of a test is determined by the time required to make it. The letter referred to declares furthermore that the Watertown machine was in constant use except when Mr. Howard, the gentleman in charge, was otherwise engaged in making out reports of the tests. The charge was now $18 per day, and the pending appropriation $10,000, which, however, was saddled with an inconvenient provision. Captain Lyle made a number of valuable suggestions concerning the best mode of promptly publishing the results of work and concerning the removal of the Watertown machine to a location more convenient to all interested.

Mr. E. D. Leavitt, Jr., who is well known to those connected with the mining industries as the designer of the famous machinery of the Calumet & Hecla, stated that he had availed himself of the Watertown machine very largely, having had made with it over a hundred tests for his own purposes, and 240 additional tests for his clients. He urged that the engineering profession was not reaping the advantages which it ought, seeing that the machine is public property. It might be asked why he did not publish the results of the tests made for him, so as to give the profession the benefit of his experience. In reply, he would say that the interests of his clients were paramount to the interests of science. For himself, however, he might say that he had learned more in certain branches by the result of two years of occasional testing at Watertown than during a previous experience of twenty-five years. The machine was now admirably manipulated, but would require a larger force to work it effectually to its full capacity.

Mr. T. C. Clarke, of Clarke, Reeves & Co., the bridge-builders, said that in engineering, as in philosophy, they passed through an era of faith, an era of criticism, and an era of scientific investigation. The latter, which we are now entering upon, and which is the most important of all, demands experimental proof on large-sized specimens. We have in this country a machine to do this work, though it would require some additions. It should be used for the benefit of the country, and a person be employed to conduct experiments under the direction of an advisory board which would collate the experiments. His firm had had a series of elaborate tests made of Phœnix columns, which suggested many lines of investigation. Mr. Clarke said that though bridge-builders knew that steel was the material of the future, the reason why they did not use it more extensively was, that they did not know any thing about its resistance to strains so far as large-sized bridge members were concerned.

Mr. O. Chanute, Vice-President of the American Society of Civil Engineers and Chief-Engineer of the New York, Lake Erie & Western Railroad, suggested that among the many problems which awaited early solution in connection with his branch of the profession were: The behavior of steel, the behavior of compression members, the influence of size upon strength, and many others. For these we are dependent upon either a few limited experiments made abroad a long time ago, or upon data which experience with the Watertown machine has already taught us are erroneous. We must rely upon the government machine for tests made upon the form of parts of our structures. Mr. Chanute also made some suggestions on the organization of the work.

Mr. E. P. Boller, a prominent engineer, presented a long paper, in which he presented the question at issue in a more popular form, clearly showing that the general public has as strong an interest in this matter as engineers and manufacturers.

Prof. T. Egleston, of the Columbia School of Mines, urged that the use of the Watertown testing-machine, though important, was not all that was wanted. He stated that the time would come when entire bridge sections would be submitted to experiments, to determine their strength, and then spoke eloquently on the importance of clearing up many dark points concerning the uses of alloys, instancing the cartridge manufacture as one in which alone the government had large interests at stake.

Mr. John Bogart, Secretary of the American Society of Civil Engineers, read a letter from Mr. G. H. Morrison, and quoted from the writings of the late A. L. Holley on the subject.

Mr. Percival Roberts, Jr., of Philadelphia, spoke from the stand-point of a manufacturer of iron, and gave some striking instances of the unreliability of the ordinary methods of testing iron and steel in small samples. They had made contracts for certain kinds of iron for the Penn-

sylvania Railroad, which, according to the results of tests in small samples at Pencoyd and at the works of the Fairbanks, had been rejected; while the figures given by testing larger bars at Watertown had proved that the metal was up to specifications. Mr. Roberts showed at length in what an unsatisfactory state the testing of materials was at the present time.

In closing the debate, President William Metcalf dwelt with much force upon the fact that the present system of the testing of materials by private individuals and users, can not give the latter a full knowledge of the material because they do not know the history of its manufacture. Failures that would be inexplicable to the user might be readily accounted for by the maker, who was not, however, of course, disposed to betray facts which would only be used by his competitors.

THE PATIO AMALGAMATION PROCESS AT GUANAJUATO, MEXICO.

Except in the writings of some French and German metallurgists accessible only to a few, and quite recently in Percy's new volume on the Metallurgy of Silver and Gold, we do not possess any good description of the *Patio* amalgamation process, which has yielded in the past and still continues to yield so large a proportion of the silver supplied to the world annually by mines in Spanish American countries. A very full account with numerous practical details has been published by Miguel Rul in the *Minero Mexicano*, as one of a series of articles.

The first operation of working the ores is to grind them in a Chili mill to about 0·32 inch. The mill consists essentially of a large vertical wheel of iron or stone 5·51 feet in diameter, and 1·25 feet wide. It is bound by an iron tire, of the same width and 4 inches thick. The wheel is attached to a horizontal shaft, one end of which is attached to a post in the center of the mill, while the other end is fitted with arrangements to hitch on the mules which work the mill. The wheel runs in a gutter 1·62 feet wide, paved with iron. Between this gutter and the central post is a screen having the shape of a truncated cone covered with brass wire cloth having 0·5 to 0·6-inch mesh.

The crushed ore goes to the arrastras, in which it is ground to pulp, the yield depending much upon this operation. The arrastra is circular, 11·55 feet in diameter, and is formed of paving-stones or flags of hard quartzose porphyry. A post in the center of the arrastra supports a wooden cross, to each of the arms of which a large stone is attached. One of the arms is extended beyond the arrastra, and to it the two mules which run the arrastra are hitched. Together, the four stones which do the grinding weigh about 35 arrobas or 887 pounds. The quantity ground per 24 hours varies, according to the hardness of the ore and its richness, between 8 to 12 quintals, or 800 to 1200 pounds. In this time, from 920·5 to 1196·64 liters, or 230·1 to 299·1 gallons, of water are used, about 138 gallons being put in at the start and additions being made from time to time, the greatest quantity being added about two to three hours before discharging. Much importance is attached to the quantity of water used and to the manner in which it is added, it being held to affect the success of the pulping and the quantity of gold which is obtained. In discharging the pulp from the arrastra, care is taken not to stir it up, so that any coarser particles are left behind in it.

In beginning to grind in an arrastra, either when it has a new bottom or when the bottom has been scraped, the interstices between the stones must be filled, and it is usual in these cases to grind low-grade ores in them. As soon as the arrastra is in good working shape, a certain quantity of quicksilver, amalgamated with silver, copper, or zinc, is thrown into it and carefully distributed. The quantity of amalgam thus added depends upon the quantity of gold in the ore, and upon the amount of it worked in the arrastra before it is cleaned out. Generally, when 800 pounds of ore are treated in an arrastra per day, or 11 tons in 30 days, 12 pounds of amalgam, containing approximately 9½ pounds of quicksilver, are charged. This quantity, which is put in in the beginning, does not well suffice to gather the gold and a part of the silver, that being the object for which it is used. In the beginning, it will amalgamate those metals readily; but it loses this property in proportion as the quantity of liquid mercury becomes less, and therefore fresh quantities must be added from time to time. It is customary, therefore, to take samples twice or three times a week, or oftener if the ore is rich, by clearing out one quarter of the arrastra down to the bottom, where a mixture of ground material and amalgam is taken out. This is washed, and from the nature of the amalgam the quantity of quicksilver is determined. If the amalgam unites or is in the shape of large and compact fragments, it is still saturated with quicksilver and may continue to be used to amalgamate. When, however, it is found to be very dry, and, on pressure by the finger, leaves a dull surface, more quicksilver is added.

When the ore contains no native silver, generally 10 to 12 per cent of its contents is gathered in the arrastra amalgam.

When the amalgam in the arrastra is rich enough, or there is a sufficient quantity in the bottom of the arrastra, the latter is cleaned out. The bottom is taken out, and the fine material filling the interstices between the stones is gathered, washed, and worked with quicksilver. The amalgam taken from the arrastra usually contains from 18 to 22 pounds of silver and gold per 100 pounds of quicksilver.

The pulp is worked further in the *patio*—a large area carefully smoothed and rendered impervious to mercury, and so inclined that the water will flow off easily. As soon as 100 *montones*—about 147 metric tons—of pulp are gathered, that quantity forming a pile called a *torta*, the pulp is spread out on the *patio* in a layer 0·75 to 1 foot thick, the sides being inclosed by large wooden beams. By evaporation and draining, the ore loses its excess of water, the pulp attaining the proper consistency after four to six days. A sample is taken for assay, to check the work done in the arrastras, the difference between the assay of the ore before treatment and the *patio* assay giving a tolerably accurate idea of the work of the arrastra. Then salt is added to the *torta* or pulp-pile, the quantity varying according to the richness of the ore. When it holds 4 to 6 *marcos* per *monton*, or about 30 to 43·5 ounces per ton, 5 *arrobas* per *monton*, or 3·9 per cent of salt, are added; for 6 to 10 *marcos*, or 43·5 to 72·5 ounces, 4·68 per cent of salt. The salt is evenly sprinkled over the surface of the *torta*, and then what is called the first *repaso* is made; that is, the pulp is mixed with the salt by driving mules, generally 24 for a 147-ton *torta*, over the pulp for a period of 8 hours.

On the day following the "salting" of the pulp, "*magistral*" and quicksilver are added, the *magistral* being sulphate of copper or copper ore so roasted as to contain a considerable quantity of that body. The operation of adding these substances is called *el incorporo*. A second *repaso* or mixing follows immediately; and this operation of mixing is repeated every third day for eight hours. On the same day, another operation, called *voltear la torta*, or "turning the pile," is performed by workmen who turn it with shovels. The quantity of *magistral* used varies much, according to circumstances. It depends upon the percentage of sulphate of copper in it, and upon the nature of the ore and the temperature. Taking pure sulphate of copper as a basis, the quantity is about 4·5 to 5 pounds per ton for 36·25 to 58-ounce ore. As for the influence of the nature of the ore and the temperature, practical experience with every given grade can only determine the correct proportion. It may be stated, however, that, other circumstances being equal, less magistral is added in the winter than in the summer. Generally 8 pounds of mercury are added for every pound of silver the ore contains, though in some cases only part of the whole amount is put in at the start. Every day, one or more samples are taken during the course of the operation, with the object of watching its progress. The sample is panned, and from the nature of the globule of quicksilver, the fine amalgam—some of it being bright and some dull—and the ore, the state of the amalgamation is judged, and any errors are corrected, either by adding fresh quantities of ore or precipitate of copper in the beginning of the work, or precipitate, ashes, or lime toward the close when any "heating" is noticed, and a little "magistral" or sulphate of copper when it is too "cold." The amalgamation takes from 20 to 30 days, according to the nature of the ores; and when completed, the pulp is washed or passed through settlers. The apparatus for this purpose consists of three or four large circular wooden or brick tanks communicating with one another. They are provided with a stirring apparatus, which is kept going for a period of an hour and a half, or longer if necessary, it taking from 2 to 3 days to work one *torta* of 147 tons. The amalgam obtained is cleaned, pressed, and heated, these operations not being done in any way worthy of note.

Both in cleaning out the arrastras and during the settling process, a certain quantity of a product is obtained, holding argentiferous pyrites with more gold than the original ore assayed, and which also has some amalgam. This product is concentrated on plane tables of some convenient form, and the concentrates are ground and roasted, in order to be used as magistral; or they are first roasted and then worked in an arrastra, in order to obtain the silver and gold they contain. Generally about two per cent of the precious metals in the ore is obtained in this way. Usually the loss in the patio process ranges from 5 to 8 per cent, the loss of quicksilver being 10 or 12 ounces for every marco of silver (7·25 ounces) extracted; of the free gold in the ore, about 75 per cent is extracted, but when present in sulphurets, only 40 per cent or less.

The following estimate of cost of the patio process is given under the supposition that corn costs $1.37½ per *fanega* (about 10 bushels), and straw 15·5 cents per *arroba* (27·5 pounds), per 56 *montones*, the work of one week:

GRINDING.

8 mules, fodder one week	$10.50	
4 workmen	13.50	
1 mule-driver	5.00	
Repairs	4.00	
Night shifts	19.00	
Total for 56·25 montones	$52.00	
Grinding per monton		$0.92

WORKING 10 QUINTALS IN 30 ARRASTRAS.

130 mules, at 18·75 cents per day, seven days	$170.63	
1 foreman	13.00	
1 helper	7.00	
3 feeders, at $3	9.00	
5 arrastra men, at $4	20.00	
3 watchmen, at $4	12.00	
3 men, at $3	9.00	
170 bottom stones	10.62	
13 grinding stones	32.50	
Total (56·25 m)	$283.75	
Arrastra working per monton		$5.04

PATIO WORKING.

25 mules for 100 montones, for one repaso:			
Mules	$4.68		
7 workmen	3.50		
	$8.18		
Or 8 cents per monton per repaso.			
14 repasos		$1.12	
5 arrobas (137 5 pounds) salt		2.50	
13 Spanish pounds sulphate, at $12 per quintal (110 lbs.)		1.36	
Labor 56 25 montones, $15		0.28	
Total patio working per monton			$5.46

SETTLERS AND DISTILLING.

10 mules, 4 days	$7.50	
Various expenses	38.00	
32 arrobas charcoal	6.00	
Total	$51.50	
Settlers and distilling per monton		$0.51

GENERAL EXPENSES.

Salaries	$65.00	
Rent	25.00	
Repairs and miscellaneous	35.00	
Total	$125.00	
General expenses per monton		$2 22
Total cost of working per monton		$14.15

Or, as one monton is equal to 1·62 tons of 2000 pounds, the cost of working on the patio process would be $8.98. We would note, however, that no allowance is made in the above estimate for the cost of quicksilver which is, according to the data given, a very considerable item.

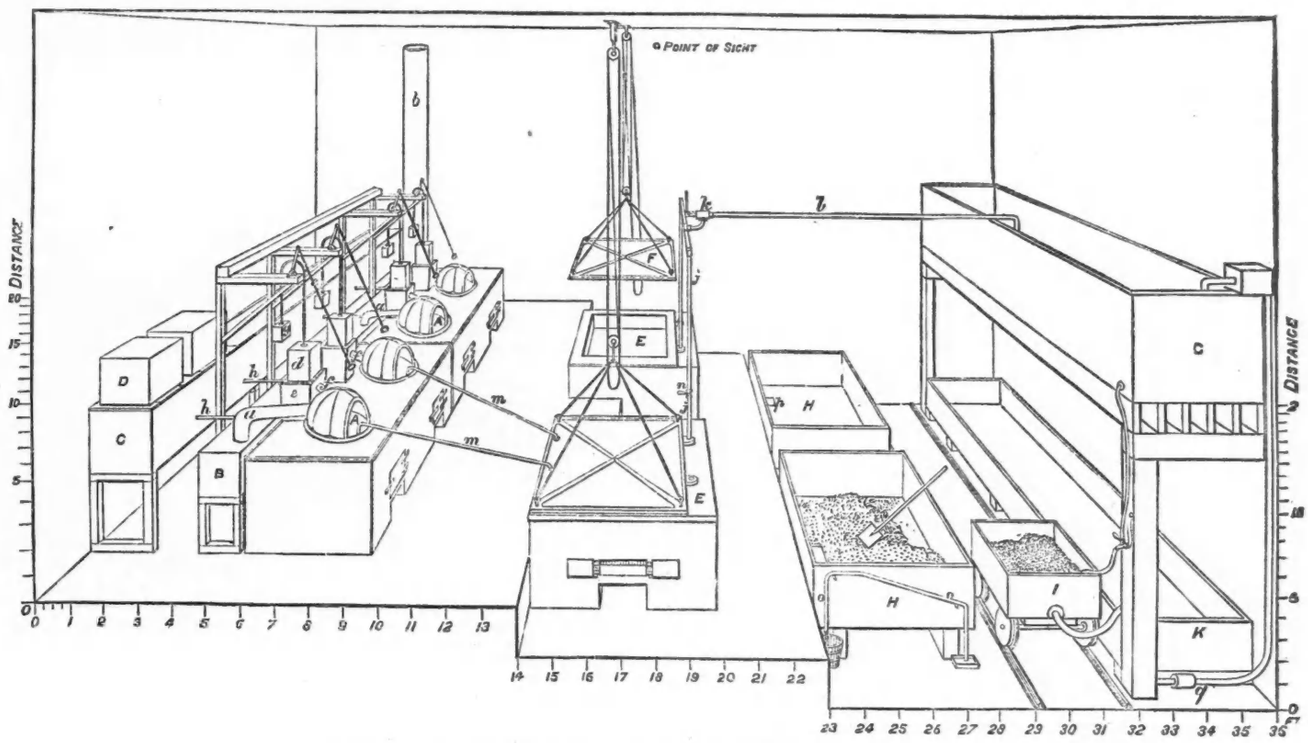
THE GUTZKOW PROCESS OF PARTING.

In his recently published Volume I. of the Metallurgy of Gold and Silver, Dr. John Percy describes at length the Gutzkow method of parting silver and gold. As that method has been in practical use for many years, and so authoritative a description has not befoer been printed, we take the following from Dr. Percy's somewhat elaborate account:

"The crude gold (in value about 20 millions of dollars yearly) is received in San Francisco from California and the adjacent States and territories in bars, cast and stamped by assayers in the interior, and is on the average 900 fine, with 1 to 2 per cent of base metal. The 'silver doré' comes mostly from the Comstock mines, which produce very fair bullion, 990 fine in gold and silver, with generally not less than 2, but frequently as much as 10 or more per cent of gold. Some other districts, Reese River, for instance, send bars with only traces of gold, 800 fine in silver, the balance being copper. The works which treat the tailings from the Comstock mills turn out bullion with from 1 to 2 per cent of gold and 15 or more of copper. Mexico sends its dollars, celebrated the world over for liberality in weight and assay, with just a trifle of gold, not worth mentioning, per dollar, but agreeably surprising when parted by the ton. Japan sends occasionally its quaint square coins, containing 250 of gold per 1000 and no copper, for refining; but there seems to be an end to the stock of coin in that country, as other people engaged in the Japanese trade have found out.

"The bullion is assorted in the following three classes: 1. Gold bars, which are melted and granulated with Comstock and low-grade silver, to produce a proportion of nearly 2 parts of gold to 3 of silver, with a small percentage of copper. This alloy is probably the richest in gold that is anywhere subjected to parting, and was originally adopted when refinable silver was only sparingly obtained in the San Francisco market. When properly treated, it yields gold of not less than 990 fine (which is the standard required by the United States Mint), in large and hard grains, exceedingly well adapted for sweetening (that is, purifying by washing after parting), pressing, and melting. An experienced refiner will correctly predict the fineness which the gold will show after melting, within one thousandth, from its appearance when still in the refining-pot. 2. Comstock silver bars, which are parted *per se*, just as they come from the mine, chips being cut for assay. Formerly they were granulated with an addition of copper (or of low-grade bars when on hand), and yielded gold of 960 to 980 fineness, which had to be melted with silver and copper and granulated, like crude gold, as described above. Besides, the gold was frequently 'mushy,' that is, soft and powdery, sweetening slowly, and settling with difficulty in water or acid. In 1865, Mr. John Reynolds, an intelligent workman, suggested the refining in bars. Of course, there was no doubt that even the heaviest bars would finally dissolve in hot sulphuric acid; but nobody then believed that a bar weighing nearly 100 pounds, 12 inches long, 6 inches broad, and 5 inches high, would dissolve in less time than when granulated. The result was, however, surprising. The charges of the refining-pots could be raised from 140 pounds to 200 pounds by operating upon bars instead of granulated metal; the dissolving was finished in four hours, as previously; the gold turned out, after the first and only boiling, of a wonderfully uniform fineness of 998; and last, but not least, the gold was hard and not 'mushy,' settling and sweetening rapidly. 3. Bars containing much copper, which are melted with higher grade bars until a proportion not exceeding 12 per cent in copper is obtained. They are not granulated, but cast into bars, about 1 inch thick, and yield, by Reynolds's method, gold about 992 fine. The charge of the pot has to be somewhat smaller, in order to finish the parting in the same time as a charge of Comstock bars would require. It may be remarked here that the presence of a small percentage of lead rather facilitates than retards the dissolving of such coppery bars. Sulphate of lead is much more soluble in highly concentrated boiling acid when saturated with silver than is generally assumed. There is no trouble at all in refining silver bars with as much as 5 per cent of lead, excepting that the resulting gold is very brittle. The usual method in San Francisco of toughening fine gold bars is by sal-ammoniac and (in stubborn cases) by a weak blast on the surface of the molten metal, which is most effectual in removing lead from gold."

The flat-bottomed dissolving-pots *A* are less than two feet in diameter, and when new are only ¾ inch thick, wearing down to ¼ inch in the course of two years. Each pot has a separate fire-place, and is covered by a cast-iron dome, from which the lead pipe *a* leads to a closed tank *B*, and thence through a larger pipe *b* to condensers. The sulphuric acid in the tank *C* is supplied to the pots by forcing a counterweighted plunger



REFINERY FOR PARTING BARS BY SULPHURIC ACID.

d into the bucket *b* through the overflow-pipe *f*, thus discharging 20 pounds of acid into the pot.

Two hundred pounds of silver bars are dissolved with 300 pounds of sulphuric acid in four hours, the gold remaining behind as a hard and heavy gravel. The silver solution is siphoned off into the cast-iron pan *E*, having a capacity of 50 cubic feet, by placing a cover *F* on it, and allowing the steam suction apparatus *K* to work, the solution flowing from the pots *A*, through the pipes *m*. The mother liquor is drawn from *H* to *E* in a similar manner, by creating a vacuum in *E* by the suction apparatus, the steam of which is utilized in heating the liquid with which the tank *G* is filled. Before running the silver solution into *E*, it is filled up to within three inches of the top with mother liquor from a previous crystallization, which consists chiefly of sulphuric acid of 58 degrees Baumé, heated to about 250 degrees Fahrenheit. After the silver solution is added, sufficient water is put in to reduce the specific gravity of the solution to 58 degrees Baumé; otherwise, on cooling, the silver would be separated partly or wholly as a bisulphate, which, on contact with water, would form a powder retaining much free acid, and would in that state be entirely unfit for further treatment. The object is to separate the silver as a mono-sulphate as hard as possible, from as acid a solution as possible, for which 58° Baumé is about the limit. Above that strength, the formation of bisulphate begins, never below. The addition of water to the contents of *E* serves also essentially to purify the solution. Any sulphate of lead still dissolved is, practically, wholly precipitated, and the cloud of sulphate of silver produced by the dilution with water clears the solution most rapidly of all suspended matter. The iron, which was present in the strong silver solution as an insoluble neutral sulphate of peroxide and caused its yellow and muddy appearance, absorbs water in the weaker acid and settles as a greenish basic sulphate. Once every month, the sediment covering the pan *E* to about the hight of 3 inches is removed and dissolved in water. It consists of sulphates of iron, lead, and silver, some gold, and a graphitic substance derived from the cast-iron pots and tools. The residue, after treatment with water, is mixed with some granulated zinc, to reduce the sulphate of lead, and, after hav-

ing been washed and dried, is melted in a small reverberatory furnace with the addition of carbonate of soda, no other flux being able to remove the graphite so rapidly.

The purified and clarified solution in *E* is siphoned off into the open pan *H*, in which it is allowed to cool over night to about 80 degrees Fahr., and in it the sulphate of silver crystallizes so that the mother liquor can be pumped back into *E*. The crystals are removed to the filter-box *I*, a layer of precipitated silver over the false wooden bottom serving as filter. A stream of a hot solution of green vitriol of 25 degrees Baumé is admitted from the tank *G* and allowed to percolate the crystals, converting them into a very heavy and dense mass of metallic silver which retains the shape of the crystals. The sulphate of protoxide of iron is converted into sulphate of peroxide. The first portion of the solution contains some sulphate of copper, which is precipitated by iron. The solution of peroxide of iron is reconverted into protoxide solution by putting sheet-iron into it, thus rendering it fit to be used over again.

The more neutral the crystals of sulphate of silver and the solution of sulphate of iron is, the more rapid the reduction will be. The reduction of 700 pounds of silver, the result of dissolving the contents of four pots, is effected in three hours. The iron solutions which pass through the filter contain some silver, 90 per cent being in the filter, 7½ per cent being obtained from the solutions in cooling and 2½ per cent being regained by the corrosion of the iron solution by iron and by copper from the blue copper solution.

After sweetening with water, the silver is converted into cakes 3 inches thick and 10 inches diameter, by pressing it under an hydraulic press. They are dried and melted.

The gold remaining behind after dissolving is boiled again with fresh acid when obtained from granulated alloy. Gold from bars does not need this, being 996 fine at the first boiling.

STEEL FOR TIRES AND AXLES.

Mr. Benjamin Baker has made an interesting inquiry to learn whether the steel supplied for tires and axles by various English and continental makers was uniform. His results, which are published in the proceedings of the Institution of Civil Engineers, were "startling and unsatisfactory." He found that not only was there no uniformity in the quality of the steel supplied by the several makers, but that even two tires of the same maker as a rule differed widely in behavior under test. Thus the tensile strength of the steel in twelve tires examined ranged from 32·25 tons to 49·5 tons per square inch, and the extension from 5 per cent to 25 per cent, while under the "drop-test" one tire might fail at the second blow of a weight of 1 ton falling 10 feet, and the next only do so at the twelfth blow from the increased hight of 30 feet, the respective bendings before fracture varying from no less than $\frac{9}{16}$ inch to 28 inches in the 3-foot tire.

Similarly, the tensile strength of the steel in the axles ranged from 27·35 tons to 40·7 tons per square inch, the extension from 17·6 per cent to 23 per cent, and the number of blows sustained before fracture from 3 to 35. Mr. Baker's tests indicate that a high rate of elongation affords no guarantee that a tire or axle will behave well under the drop-test, and probably no efficient substitute could be found for the rough and ready test of endurance afforded by the bending and straightening blows of a weight of 1 ton falling 20 or 30 feet.

He urges that it would be imprudent for an engineer to leave the choice of the quality of the steel to the makers or to forego the most rigid system of inspection. Mr. Baker points out that though half a dozen specimens may be cut for testing from an axle or a tire and give satisfactory results, yet a weak spot may escape detection.

THE GERMAN SPELTER INDUSTRY.

At the present time, when considerable quantities of spelter are imported from Germany, and the sales for future delivery indicate an increasing strength in this movement, some data concerning the spelter industry of the most formidable rival of our common Western metal in Eastern markets are of value. In a recent issue of the *Verhandlungen des Vereins zur Beförderung des Gewerbfleisses*, Herr Oskar Bilharz, of the Altenberg Company, treats of the Western or Rhenish District, while Herr E. Althans, a well-known authority, reports elaborately on the Silesian District. Though both reports relate to the year 1880, the technical questions involved and, to a certain extent, the commercial status are unchanged.

Herr Bilharz gives the following valuable estimate of the production of Europe, the figures being in metric tons:

	1879.	1880.
Germany	96,360	99,405
Belgium	63,007	65,010
England	16,750	22,000
France	14,467	13,715
Austria, Poland, etc	3,200	3,200
Total	193,784	203,330

Silesia produced 63,476 tons in 1879, and 65,437 tons in 1880, leaving 32,884 and 33,968 tons respectively to the rest of Germany. Up to the present time, the supply of German zinc ores keeps pace with the increasing production; but the use of blende instead of calamine, carbonates, and silicates is steadily increasing. In the Aix la Chapelle District, for instance, the quantity of blende treated has, in three years, reached a quantity double that of the calamine used. The following figures may serve to illustrate the increase in that district:

	1870. Tons.	1880. Tons.
Calamine	21,600	19,690
Blende	31,790	34,580
Total	53,590	54,270

Besides the German ores, the works of the Rhenish District draw largely upon the northern and southwestern coast of Spain, and upon Sardinia. Quite recently, the mines of Laurium, in Greece, have sent rich ores running as high as 62 per cent. Herr Bilharz states that, while no trouble is at present experienced concerning the supply of calamines, he seems to fear that in a few years, when the Mediterranean mines, now worked to full capacity, approach exhaustion, the question will become a serious one, because the manufacture of zinc from blende is not alone more expensive, but also furnishes a poorer grade of metal. Some of our Western works which are contending with the same difficulties will appreciate the importance of this confession. Herr Bilharz gives the following interesting figures concerning the articles into which the spelter made by the Vieille Montagne Company of Germany and Belgium, the largest producer of the world, is manufactured. It will be seen that sheet-zinc is in that district the most important article:

	1879.	1880.
Production of spelter	43,750 tons.	44,690 tons.
Manufactured into:		
Sheet-zinc	41,882 "	37,522 "
Zinc-white	6,016 "	5,283 "

Herr Althans, who reports on the great Silesian District, goes into the questions at issue much more at length. The causes which give that district such a commanding position, notwithstanding its remoteness from the markets of the world and the low grade of the ores, are that the zinc mines are located in close proximity to the coal mines, and that mines and works are in the hands of a few strong parties. The cost of the raw materials is, therefore, very low. While the older calamine mines are gradually becoming exhausted, blende, which predominates in the lower workings, is more and more superseding calamine. The necessity of roasting it and the difficulty of handling the gases of the roasting process increase the cost of working. The manufacture of sulphuric acid from the gases is less profitable than in other districts, because the market for acid is limited and the blende contains arsenic. Only one works is making sulphuric acid, and that one has not introduced it for an extension of the plant recently made. The other works are forced to adopt some means of getting rid of the roasting gases, and generally use towers in which the sulphurous acid is absorbed by milk of lime. It may be of interest to state here that one of the largest of our Western works is now putting up a sulphuric acid plant in connection with blende roasting.

The lead ores associated with the zinc ores of Silesia have hitherto paid for a part of the cost of mining. It is found that they are not only much more difficult to separate by dressing from blende than from calamine, but also that in the former they are poorer in silver than in the latter. The larger producers are, on the other hand, favored by the large extent and the regularity of their deposits, and by the cheapening of freights by the construction of narrow-gauge roads between the mines and the works.

The production of zinc ores in 1880, the quantities taken from (+) or added to (−) the stocks at the works, and the actual consumption of the latter are given in the following table:

Kind of ore.	Production.	Drawn from or added to stock. Tons.	Total supply of works. Tons.	P. c.
Calamine	449,672	+ 22,865	472,537	84·6
Blende	81,322	− 8,516	72,806	14·6
	530,994	14,349	545,343	99·2
Excess of imports and exports of ore			3,185	0·8
Total			548,528	100·0

The following table will serve to show the development of the Silesian zinc industry since 1810:

Period.	Average annual production of Ore.	Average annual production of Spelter.	Value of ore in per cent of value of spelter.	Pounds of coal per Pound of ore.	Pounds of coal per Pound of spelter.
1810-1819	2,600·0	680·0	23·1	5·30	20·20
1820-1829	27,984·0	7,466·0	24·0	4·00	15·80
1830-1839	37,445·5	8,190·6	51·0	.....	.....
1840-1849	94,779·1	17,068·0	21·9	3·284*	14·75*
1850-1859	180,915·1	30,352·0	42·5	2·594†	14·15†
1860-1869	275,938·1	38,155·4	35·3	2·557‡	19·03‡
1870-1879	392,988·8	45,224·3	38·5	1·607	14·60
1880	530,994·0	65,443·0	36·6	1·529	12·40

*6·5 per cent being slack. †18·4 per cent being slack. ‡48·6 per cent being slack.

The reduction in the consumption of fuel is due to the introduction during the years 1870 to 1880 of gas firing, either in the shape of step grates with upper and lower blast or the Siemens regenerative system with natural draught. The former is economical, because it allows the use of otherwise unsalable slack; while the latter, notwithstanding high first cost, is cheaper still, although market sizes of coal must be used. Herr Althans says that, in consequence of the almost general introduction of the gas firing, the smoke is almost entirely disappearing. He expresses his surprise that the recuperative system introduced by Dr. Wedding at the small Friedrichs works at Tarnowitz has not been more generally adopted, as it combines the advantages of both of the above methods. The upper blast is heated in a cast-iron hot stove. The following table will best illustrate the effect of the introduction of these improvements:

	Production of spelter. Tons.	Yield of ore. Per cent.	Consumption of coal per pound of Ore.	Consumption of coal per pound of Spelter.
1860	40,354	15·3	2·699	17·63
1870	36,444	12·8	2·455	19·16
1871	31,971	12·1	2·0·0	16·50
1872	32,502	9·6	1·425	14·80
1873	36,719	10·0	1·343	13·40
1874	41,518	11·3	1·575	13·97
1875	43,194	11·4	1·666	14·60
1876	49,377	11·0	1·553	14·14
1877	57,423	12·0	1·526	12·70
1878	59,619	11·8	1·509	12·78
1879	63,476	12·7	1··20	11·21
1880	65,443	12·3	1 5·9	12·41

Herr Althans gives the following estimate of the cost of manufacture of spelter, the cost of the ore, which is generally mined by the smelting

companies themselves, being placed at the assessed valuation of the government for purposes of taxation :

	Per metric ton of ore.		Per metric ton of spelter.	
Assessed valuation of ore	15·23	Marks.	129·45	Marks.
Freight to works, unloading, etc.	1·70	"	14·45	"
Fuel	5·78	"	49·10	"
Wages	5·20	"	45·00	"
Other expenses	2·94	"	25·00	"
Interest and sinking fund	3·06	"	26·00	"
Total cost	34·00	"	289·00	"
Average selling price	39·77	"	338·00	"
Average profit	5·77	"	49·00	"

Spirek gives the following figures for four Silesian works :

	1.	2.	3.	4.	Average.
Cost of ore at works	203·8	209·0	200·0	195·0	202·0
Cost of fuel	82·0	60·4	40·0	38·0	52·6
Other expenses	80·0	67·7	67·8	65·0	70 1
Total cost	365·8	337·1	307·8	298·0	324·7
Average selling price	338·0	338·0	338·0	338·0	338·0
	−27·8	+0·9	+30·2	+48·0	+33·1

The German imports and exports of spelter and sheet-zinc during the year 1880 were as follows, in metric tons :

	Imports from.		Exports to.	
	Spelter.	Sheet-zinc.	Spelter.	Sheet-zinc.
Bremen	47·7	3·2	.....	15·3
Hamburg	620·4	36·5	17,388·9	5,007·6
Denmark, Sweden, and Norway	54·2	.....	.....	1,248·3
Russia	.....	.....	488·3	993·4
Austria-Hungary	705·8	2·3	6,845·3	499·3
Switzerland	.....	2·2	.....	173·1
France	.....	10·5	1,956.0	.....
Belgium	1,755·4	56·9	1,200·5	235·3
Netherlands	76·2	2·3	3,158·4	1,254·2
Great Britain	631 3	.....	8,573·4	2,772·4
United States	.....	.....	.....	134·0
Other countries	98·8	0·9	921·6	50·9
Total	3,989·8	114·8	40,622·4	12,524·8

It will be noted that a very considerable portion of the exports are to Hamburg, which, being a free city, is outside of the German customs union. Hamburg is really the main distributing point for spelter exported, the other figures being only shipments from other German ports. To a certain extent, the metal that goes into the Netherlands is really only in transit. It is not therefore correct to assume that the figures given under "United States" represent all of the German spelter and zinc which has come to this country.

THE COKING COALS OF THE CUMBERLAND RIVER, KENTUCKY.

Prof. John R. Proctor, director of the Geological Survey of Kentucky, has published the following, in his reports of progress, on the coking coals of the Cumberland River, Kentucky :

It was discovered that there was, just beyond the State line, in the divide between the head-waters of the Powell River and the waters of the Cumberland River, a coal suitable for the production of coke of superior quality. The importance of such a coal in determining the development of manufacturing in the Ohio Valley is very great. The entire region between Pennsylvania and Colorado is supplied with coke from the Connellsville region, Pennsylvania, and Quinnemont region, West Virginia. From the former region, 600 car-loads of coke are sent away daily. Believing that this coking coal could be found in the drainage of the Cumberland and Kentucky rivers, Professor Crandall was sent there during the past season to make search for and trace this coal as far as possible. His success was greater than anticipated.

This coal was found and traced over a wide area on the head-waters of the Cumberland, Kentucky, and Big Sandy rivers, above drainage, and averaging from 7 feet to 8 feet thick. The following analyses by Dr. Robert Peter, Chemist of the Geological Survey, show the great value of this coal. These analyses are from carefully averaged samples. Nos. 1, 2, and 3 are from Letcher County, Nos. 4 and 5 from Pike County, and Nos. 6 and 7 from Floyd County. The location of the above coals are not given, because I deem it proper that the results of analyses and tests should be given to the owners of coals examined by the Survey before the same are made public in the published reports, whenever the names of the proper owners can be ascertained :

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.
Specific gravity	1·355	1·319	1·291	1·271	1·282	1·302	1·281
Moisture	3·00	2·86	3·26	2·00	2·60	2·04	2·10
Volatile combustible matter	30·06	31·54	32·24	35·50	34·10	37·42	37·16
Fixed carbon	57·60	62·10	61·50	60·54	61·80	54·34	54·74
Ash	4·34	3·50	2·90	3·96	2·40	4·20	3·00
Sulphur	·494	·535	·656	·429	·412	1·475	·596

For the purposes of comparison and enabling an estimate to be placed on the value of these coals, I give below analyses of some of the best of the celebrated coking coal of Pennsylvania. No. 3 is the coal at Connellsville. Analyses copied from Volume L, page 63, Second Geological Survey of Pennsylvania :

	No. 1.	No. 2.	No. 3.	No. 4.
Moisture	1·260	.....	1·260	2·375
Volatile matter	30·107	22·380	30·107	32·565
Fixed carbon	59·612	68·500	59·616	49·955
Ash	8·233	8·000	8·233	13·145
Sulphur	0·784	1·120	0·784	1·960

Here we have for comparison analyses from the best coals of Pennsylvania, so determined after years of working, and analyses from coals opened in a few weeks' exploration in Kentucky. We have reason to believe that this remarkable coal-bed can be identified and traced farther north, and will prove one of the most valuable coal-beds in America, if not the most valuable.—*Coal.*

LABOR IN THE COAL MINES.

Prof. Raphael Pumpelly, in his preliminary Census Report on the production of bituminous coal, has printed two short tables, which are particularly interesting and significant. They are intended to illustrate in a general way the proposition that large mining establishments which employ power and labor-saving machinery can pay higher wages and give more steady employment to labor than smaller ones. Professor Pumpelly has chosen 187 mines in Ohio and 100 mines in Indiana, which were typical ones in four classes : the first class including mines using no power to supplement manual labor ; the second, such collieries using the power of animals only ; the third, such mines working with boilers of less than 100 horse-power ; and finally, a number of such mines using boiler power exceeding 100 horse-power. We extract the following leading data :

Class.	Number of mines.	Average annual production net tons.	Average cost of labor p. ton.	Average wages p. day.	Average product p. man p. day.	Per cent of value of product paid for labor.	Per cent value of product paid for materials.	Per cent of value of product for profit, interest, repairs, and royalty.
Ohio No. 1	12	832	$0.93	$1.23	1·33	59·10	7·47	33·43
" No. 2	88	23,500	.77	1.27	1·64	68·42	16·57	15·01
" No. 3	78	27,300	.96	1.42	1·49	69·34	10·86	19·80
" No. 4	9	44,990	1.03	1.70	1·66	66·13	10·95	22·92
Indiana No. 1	12	817	.87	1.25	1·44	64·00	5·00	31·00
" No. 2	36	3,991	.84	1.57	1·88	56·00	14·60	29·40
" No. 3	48	23,839	.97	1.50	1·55	65·00	7·00	28·00
" No. 4	4	30,654	1.11	1.64	1·48	73·00	7·00	20·00

In the third and fourth classes, the average cost of labor per ton is higher both in the Ohio and in the Indiana mines than in the first and second classes, and that particularly in the former the wages paid per day are greater. The percentage of the value of the product absorbed by the payment of wages too shows a notable increase. In those mines which use horse-power, the percentage of the value of the coal which is required for materials is naturally greatest, as it includes the amounts paid out for the feed of horses. In the Ohio mines, the amounts available as profits, interest, repairs, and royalty, excluding those in which only manual labor is used, exhibit a steady increase in proportion as more power is employed. In the Indiana mines, on the contrary, there is a decrease. Professor Pumpelly is therefore justified when he says : "As a general rule, the mines employing capital most liberally can afford to yield to labor a larger share of the value of the product, since their profits depend on the volume of their business. They also employ more skilled labor. It is believed that these features run through the entire mining industry."—*Coal.*

CHAIN HAULAGE IN BELGIUM.

Mr. Henry A. Vezin, of Philadelphia, has printed the following interesting paper in the proceedings of the Engineers' Club :

At Mariemont, on the two properties Mariemont and Bascoup, Belgium, both under the same management, chain tramways (*trainages méchaniques*) are used ; those on the surface, for the purpose of connecting all the shafts of one property with its central shipping point, and those underground instead of horses. Shafts that are practically inaccessible by railroads are thus enabled to ship their coal virtually as cheaply as those favorably situated. The chains, varying from ⅝ inch to 1⅛ inches, according to the strain to which they are subjected, rest in forks, which are riveted to the front end of each car. The tracks (2-foot gauge) run up and down hill with maximum grades of 20 feet to the 100. The driving-wheels for the chains consist of a disk of about 2 feet to 2½ feet diameter, carrying forks that seize the chain. These forks are of iron or steel, and form the heads of long, heavy screws lying radially in the disk. As the length of the chain increases in consequence of wear, these forks are screwed out as many half-turns as are necessary to give the wheel the proper pitch. Whenever the chain becomes so long as to drag on the ground between cars 50 feet apart, it is shortened. The Mariemont property, with an annual production of 500,000 tons, has six large shafts connected by tramways with the shipping point, which is near one of them. The total length of the tramways on the surface is 17,187 feet, and underground 13,452 feet. The longest single one on the surface, 3904 feet in length, transmits the product of its own shaft and that of two others, one of which is 6923 feet from the shipping point. At the point of transfer, the cars are guided by hand from one chain to the other. The 16 workable veins vary from 14 to 39 inches in thickness, and are worked at depths of from 1017 to 1939 feet. The property of Bascoup has 8694 feet of chain tramways on the surface and 16,405 feet underground. There are 19 veins, varying from 15 inches to 67 inches in thickness, and worked at depths of from 689 to 2001 feet.

The chains on the surface roads are driven by stationary engines ; those underground by : (1) underground engines, (2) engines above ground with transmission of power by wire rope, and (3) by the surplus power of inclined planes underground, the power of the descending loaded cars being much more than sufficient to hoist the empty ones. In one case, I saw such an incline working two horizontal chain roads, each of 500 feet in length. In another, the loaded cars are drawn from the bottom of a small basin over a saddle and then descend a slope, the upper portion of which has an inclination of 28°, which changes in the middle portion to 22° and in the lower part to 14°. At each of the points where the change of inclination takes place, a weighted roller prevents the chain leaving the fork, and is raised about an inch as the car passes under it. The roads have no curves.

The coal is loaded in the cars where it is cut, and transported in them to the shipping point, where it is dumped upon movable screens (Briart's system) and loaded into railroad cars, the larger sizes undergoing picking on revolving sorting-tables.

PROGRESS IN SCIENCE AND THE ARTS.

Rapid Telegraphing.—By an extra effort, the Rapid Telegraph Company succeeded, in a recent trial, in sending over a single wire, from New York to Boston, fifteen hundred words in a minute.

The St. Lawrence Tunnel.—The tunnel under the St. Lawrence is to be as follows: Entire length, about 21,700 feet; open cuttings on Hochelaga side, 2500 feet, and on the Longueuil side, 4220 feet; actual length of tunnel proper, 14,980 feet. It is to be 26 feet wide inside, and 23 feet high. It will be lined with brick masonry throughout, except the fronts, which will have façades of stone. The arch will vary from 20 to 30 inches in thickness, according to the character of the ground to be supported.

A New Apparatus for the Determination of Melting-Points.—Messrs. C. F. Cross and E. J. Besson have, in a paper read before the Chemical Society, described an apparatus for the determination of melting-points. It consists of a small platform of thin ferrotype iron or silver, having an opening for the reception of a thermometer bulb and a small indentation or depression. A very small quantity of the substance is melted in the little depression, and while still liquid a thin platinum wire, bent like an L and fused into a glass float, is immersed in the liquid and held there until the substance solidifies. A thermometer is then inserted in the opening, and the whole apparatus plunged under mercury. The mercury is gently heated, and the thermometer carefully watched. As soon as the substance melts, the float rises instantly, and the temperature is noted. Stirring is unnecessary, the whole of the substance is surrounded with mercury, and the attention can be concentrated on the thermometer.

The Faure Secondary Battery.—Some very important experiments have recently been carried out at the Conservatoire des Arts et Métiers, upon the accumulating power of Faure's secondary battery. A committee, *Nature* says, consisting of MM. Tresca, Potier, Joubert, and Allard, conducted operations. Thirty-five accumulators of the spiral form, each set in a cylindrical stoneware pot about 35 centimeters high and 25 centimeters diameter, were charged in series by the current from a Siemens dynamo-electric generator worked by a steam-engine. The working electro-motive force of an accumulator was found to be from 2·15 to 2·5 volts. For twenty-two hours, the battery was charged with a current whose average strength was 8·5 ampères, the total work expended in charging being 6,020,000 kilogrammètres. The total work of the steam-engine was also measured by a dynamometer, the Siemens generator having, as it appeared, an efficiency of 71 per cent. The battery was then discharged through eleven Maxim lamps, the potential and current being accurately measured from time to time; and although the discharge lasted eleven hours, there appeared to be 70 per cent of the original energy given out in the discharge.

Railroad Accidents in 1881.—The *Railroad Gazette* publishes its usual annual summary of railroad accidents, and accompanies the analyses of the statistics thus presented with suggestive remarks. Compared with previous years, 1881 shows very unfavorably, the accidents so far as it has been possible for the *Gazette* to record them numbering 1458, 414 persons being killed and 1597 injured. This large increase is primarily ascribed to the severity of the winter of 1880–1881. The number of collisions was 536, against 437 in 1880, the increase being almost entirely due to an increase in the number of rear collisions from 274 in 1880 to 366 in 1881, which is largely attributed to the sudden increase of the number of trains on many roads. Eight hundred and fifty-seven accidents—a large increase—were due to derailments, among the causes for which figure broken rails with 85, loose or spread rails with 29, broken bridge or trestle with 44, broken wheel with 58, broken axle with 50, misplaced switch with 85, cattle on track with 42, accidental obstruction with 45, malicious obstruction with 13, and unexplained with 310. Collisions were particularly fatal to life, causing 209 deaths against 190 in derailments, while the latter are a more fruitful source of injuries, being credited with 995 against 565 such casualties due to collisions.

A Basic Lining for Copper Refining-Furnaces.—Mr. Jules Garnier describes in a patent specification the following experiments made in refining copper in a reverberatory provided with a hearth of fritted lime, upon which was placed a layer of raw limestone and the lime covered with peroxide of manganese. The furnace was then charged with arsenical copper containing a little sulphur and iron, as obtained from Rio Tinto, and the arsenical copper melted by an oxidizing current of air. The fire was then urged, and the scoria on being skimmed off was found to already contain a very large proportion of arsenic, the quantity of which in the copper was reduced by this one operation from 1·12 per cent to 0·360 per cent. The copper was then again oxidized, and a little lime added as a base, and after re-smelting and urging the fire, the quantity of arsenic contained was still further reduced to 0·143 per cent. By this time also, the whole of the iron and sulphur had disappeared. As, however, a regenerative furnace was not employed, the arsenious scoriæ were not sufficiently acid to be readily fusible, they adhered to the sides, and on "poling" a portion of the arseniate formed was reduced and became again mixed with the metal. The copper when introduced into the furnace contained 0·320 per cent of iron, whereas at the close of the operation it contained but 0·030 per cent. M. Garnier states that it is generally preferable to refine the copper on a siliceous hearth until it contains not more than about one half per cent of iron, and then to refine it on a basic hearth as above mentioned, so as to eliminate the remainder of the iron and sulphur it contains, and particularly the arsenic, antimony, or phosphorus.

Production of Pig-Iron in Germany.—According to the returns published monthly by the German Society of Iron-Masters in their excellent journal, *Stahl und Eisen*, the output of the German blast-furnaces for the year 1881 was 2,781,175 metric tons. The quantity of spiegeleisen made was 12,362 tons in December, and 12,087 tons in November.

Coal in China.—China possesses coal, and the mining of it has been undertaken in two places, one on the island of Formosa, the other near Tientsin, in the north, the first enterprise having been started by government hands. For 1878, there was an output of 14,000 tons, but for the first six months of 1880 it was at the rate of 60,000 tons for the year, while it is believed that with one or two more shafts it might be increased to 500 tons per day, or 150,000 tons per year. This coal is of fairly good quality, and costs about $1.34 per ton to mine, being sold at $2.50.

An interesting point of law is likely to be involved in the discovery of rich carbonates by the graders of the Denver & Rio Grande Railroad, on Battle Mountain. The contractors claim the right to the mine on the ground that the laborers were in their employ, while the laborers themselves claim that they were simply employed to grade the line, and that the prospecting done was on their own account. Perhaps the railroad company itself will put in a claim, on the same ground that the contractors make theirs; and if so, the arguments adduced by the contractors in defense may also serve the purposes of defense for the graders. On the whole, should the strike prove a mere "pocket," the actual profits will be likely to be absorbed by the capacious pockets of the lawyers.

Shipments of Iron and Steel from England to the United States.—According to the returns of the English Board of Trade, the shipments of iron and steel from England to the United States, during the month ended January 31st, were as follows:

	January, 1880.	January, 1881.	January, 1882.
Pig-iron	56,570	16,054	31,460
Old iron for re-manufacture	24,972	5,534	9,215
Steel unwrought	2,592	3,775	15,430
Tin plates	17,013	12,177	19,959
Hoops and sheets	4,985	220	3,733
Bar, angle, bolt, and rod	6,819	1,085	2,639
Railroad iron	15,327	7,921	27,523

The Brandt Rotary Drill at Bleiberg.—Continental engineers continue to report well of this drill. Herr S. Rieger, of Bleiberg, Austria, gives some additional details in a recent issue of the *Oesterreichische Zeitschrift*. Driving through Triassic limestone, the drill made a record of 366·7 feet in 209 shifts, the number of holes being 1488 and their total depth 3362·4 feet. The total drilling time was 620 hours 35 minutes, the average time for drilling a hole 2·26 feet deep being 25 minutes. The total consumption of nitro-glycerine was 3850 pounds. Experience made during a number of days has proved that full results are obtained by four 6-hour shifts, the progress made in three 8-hour shifts being only 75 per cent of the maximum capacity. The results given above were obtained by three shifts per twenty-four hours.

GENERAL MINING NEWS.

ARIZONA.

Old Dominion.—We are indebted to Captain Burbridge for a statement concerning the developments on this property. According to him, the principal amount of work appears to have been done in the Keystone claim, adjoining the Old Dominion. A tunnel has been run striking the vein obliquely and running on the vein 350 feet. In this tunnel, the vein is said to widen steadily until, at the face, it is entirely in ore. At a distance of about 100 feet from where the tunnel strikes the vein, a shaft was brought down from the surface, the depth being 75 feet. Below the tunnel level, this shaft has been sunk an additional 75 feet and a second level opened, which is or was extended 60 feet in one direction and about 100 feet in the other, connecting with a winze sunk from the tunnel line at about the point where the tunnel strikes the vein. This winze is sinking deeper. We are informed by Captain Burbridge that the vein widens steadily from ten inches in the shaft to more than its full width at the bottom, the hanging-wall only being disclosed there. He states that the ore ranges from 28 to 55 per cent of copper, being red oxides and green carbonates, and that it averages from $20 to $30 in gold. He proposes to work this ore in a battery, run it over plates, and concentrate it. The New York and Chicago mines of the same company are located seven miles from the Old Dominion. The ledge is reported to range from 120 to 150 feet in width, the ore being found in bodies as wide as from seven to eight feet. The developments in the New York consist of a tunnel mainly on the vein, 600 feet long; a shaft 105 feet deep; and a cross-cut from the tunnel to the hanging-wall, where, it is reported, a body eight feet wide of copper, running as high as 150 ounces in silver, was struck. On the Chicago, there is a shaft 80 feet deep and a tunnel 45 feet long. Some stripping of the outcrop has been done in all the veins of the property. Captain Burbridge states that the failure of the smelters was due to the incapacity of the person in charge, who allowed the water-jacket to burn through during the first run, had the top hot, and did not flux the ore properly.

TOMBSTONE DISTRICT.

Reviewing the mines of the district for the week ended February 11th, the *Epitaph* says:

Bob Ingersoll.—Drifting in ore on the 300 level and sinking on the winze from the 73-foot level, connection from which will be made with the old main shaft of the Blue Monday, recently conceded to the Bob Ingersoll. Arrangements will be perfected in a few days for the milling of a heavy run of ore from this mine.

Contention Consolidated.—Stopes and winzes showing well in ore. Output for last month, $121,886.23. Connection with the Flora Morrison shaft progressing rapidly.

Girard.—Before next report, the mill of this company will be at work. Should the quicksilver arrive to-day (12th), as expected by Superintendent Woods, the stamps will probably drop on ore on Monday. The tramway and incline track from the ore-dump are completed and every thing in readiness.

Grand Central.—Nothing new to report this week. Regular output of ore to mill. Sinking of main shaft and cross-cutting west on the 600 level. The drifts on the 500 level and all stopes showing well.

Tombstone.—The West Side ledge is improving in strength in the stopes of the 63 level, and with depth of shaft, which is now down 152 feet. No 3 drift, combination shaft, Good Enough, face now in 250 feet, still in ore. No. 1 winze incline, on 250 level of same mine, going down in fine body of ore. The north and south drifts from main shaft on 300 level are going ahead two feet a day; south drift now in foot-wall of ledge.

Vizina.—The drift on the 420-foot level is in 109 feet. The drift running west from the Summer drift is in 59 feet in ore of good quality. Sinking winzes on this level, which is down 12 feet in porphyry and low-grade ore. The other drifts and stopes are looking as well as usual. Raising and shipping about 20 tons a day. The Yreka shaft is down 54 feet, still in hard cement.

Woronoco.—Main shaft down 347 feet, having made seven feet last week. The spar is giving place to porphyry, with a streak of talc on the foot-wall. In the uprise there are two good walls; carbonate on the hanging-wall. Ledge about 3½ feet wide, with 8 inches of black spar. In the west cross-cut, no

change; made 4½ feet during the week. South drift on the 266-foot level carbonate still holds, and are sacking the ore. The ledge has widened to about 4 feet; made 10 feet in this drift during the past week.

CALIFORNIA.

BULWER CONSOLIDATED.—The west cross-cut from the south drift on the 500-foot level of the Standard mine is in 316 feet. The ground is very hard. The west cross-cut from the 700-foot level of the Standard shaft is in 442 feet from the shaft. The face is also in hard rock.

GOODSHAW.—The east cross-cut from 750-foot level was advanced seven feet during the week, but, owing to the heavy flow of water, work had to be suspended. It is expected, however, that the water will soon recede, and that operations can be resumed.

STANDARD CONSOLIDATED.—The shaft is reached at a depth of 1162 feet. The east cross-cut, 1000-foot level, has been run 10 feet during the week; total length, 655 feet. The face is in a good formation. The east cross-cut, 700-foot level, has been advanced 7 feet during the week; its total length is 727 feet. The west cross-cut, same level, is in 442 feet; progress, 6 feet, in hard ground. The south drift, 500-foot level, is in 680 feet. The vein in the face is 4½ feet wide. West cross-cut No. 1, on the 500-foot level, is in 316 feet; the ground is hard. West cross-cut No. 2, same level, is in 128 feet. The north drift from this cross-cut is in 65 feet. An uprise from the south drift, 500-foot level, is up 35 feet. The ledge looks about the same as in the drift. There is no change in the stopes. On the 385-foot level, the ledge is from 12 to 20 feet wide, and on the 550-foot level (incline) it is about 15 feet wide, of clear ore. The amount of bullion shipped to San Francisco was $14,839.61.

TIOGA.—The west cross-cut, 982-foot level, is now out 147 feet, a progress for the week of 9 feet. The rock still continues hard, but is interspersed with fine seams of quartz. East cross-cut, No. 2, has attained a length of 118 feet. The advance for the week was 4 feet, with no change to note in the formation. North lateral drift, No. 2, has been advanced 9 feet, making the total length 38 feet. This drift was started from cross-cut No. 4 on one of the numerous seams of quartz mentioned in former reports. When it has been run about 75 feet, it is proposed to cross-cut through the strata of ledge matter to cut the point of concentration of the numerous quartz seams which have been encountered.

THE BODIE DISTRICT.

The Bodie *Free Press* says that during February, March, and April, some interesting ground in Bodie will be prospected by cross-cuts. The Standard Consolidated will take a look at the 1200-foot level during that time and during the coming summer. At present, the cross-cut on the 1000-foot level is in a good-looking formation and a body of ore is liable to be encountered on that level almost any day. Cross-cuts from the Lent shaft will also cut through an interesting country. The Oro shaft is now down 750 feet, and a sump is cutting out. Cross-cutting will soon commence to prospect the veins encountered in the upper levels. The Tioga is looking better than it has for some time, while the Noondays are extracting the usual amount of ore.

Superintendents' reports for the week ended February 11th are as follows:

BODIE CONSOLIDATED.—During the week ended the 11th, the mill crushed 105 tons of ore. The average assay value of the pulp was $54.35 per ton. The bullion amounted to $8860.51. There were 67 tons of ore sent to the mill and 57 tons were extracted from the mine. From winze No. 6, a south drift has been started just opposite the north drift that connects this with winze No. 9. It is four feet long and some good ore is taken out. The west cross-cut from winze No. 13 was driven 10 feet farther; total length, 49 feet. Thin seams of quartz have made their appearance in this cross-cut. In the north drift from winze No. 9, there is no change in the vein. This drift is 117 feet long. The rich seam from winze No. 9 is narrow in the north drift from the west cross-cut, but it maintains its width in the south drift. Last week, 3¼ tons of ore were sent to the mill from this place, the average assay of which was $686.20 per ton.

CANADA.

The following is a statement of the value of mineral produce exported from Canada for the past two years:

	1880.	1881.
Coal	$1,050,260	$1,169,058
Gold, quartz	1,086,994	767,318
Gypsum, crude	98,503	119,399
Oils	548	181
Refined	1,449	998
Ores—Antimony	327	3,921
Copper	150,799	150,412
Iron	76,474	114,850
Lead	260	.....
Manganese	27,732	38,738
Silver	149,146	34,494
Phosphates	119,882	239,493
Plumbago	17	11
Salt	108,376	131,832
Sand	9,832	12,541
Slate	76	.....
Stone	67,304	86,508
Other articles	33,634	41,500
Total	$2,981,613	$2,916,254

COLORADO.

COLORADO COPPER.—The Leadville *Democrat* says: Until recently, the copper production of Colorado has been quite limited, and has been looked upon as a secondary product to the more valuable metals, and hence the copper industry has not been carried on to any great extent in comparison with what may be expected in the near future in making Colorado a large producer of copper brought to a marketable shape. In nearly all of the newer camps in Lake and Summit counties, as well as in many other parts of the State, copper ore is very largely found in many of the mines, but has often been neglected for want of better communication with the East, a matter that is soon to be overcome with the great advance of the iron horse, which will enable copper ores low grade in silver or gold to be shipped and treated at a handsome profit, while at the present time so many that would be rich copper mines are still hemmed in and surrounded by what may be termed inaccessible places, at least for the transportation of ore that is more purely copper. Moreover, there are many mines that contain a copper pyrite and other minerals carrying a good percentage of copper, scattered through the matrix and gangue rock of some very large veins, that could be worked economically and at comparatively small cost. Such mineral-bearing rock can usually be concentrated at small cost, and none but enriched ore need be shipped. Among localities which we think may turn out successful copper-mining regions may be mentioned the Gore range, that seems to be productive of some very fine copper ores, among which may be mentioned copper pyrites, which generally only contains about 30 per cent of copper, the rest being iron and sulphur, while numerous other ores are met with containing 40 and 50 per cent, namely, horseflesh ore and gray copper, that carry a small amount of silver. Besides what has already been discovered in the Gore range in the way of copper ores, there are many good prospects of rich gold and silver mines being discovered, both on the Eagle River side of the range as well as that part facing the Blue, where many valuable properties have already been discovered. The copper mines in the neighborhood of Snake River, as well as many near Breckenridge, will, without doubt, become important districts for the production of copper; also, down the Eagle River and around the Holy Cross District, many finds of copper ores have been made of promise, when the countries become more opened up and the necessary machinery employed.

CLEAR CREEK COUNTY.

UNADILLA.—The Georgetown *Courier* says that the Unadilla Mining Company has let a contract on the Surprise lode, the shaft being now about 40 feet deep. It is the purpose of the company to sink a farther distance of 50 feet. So far, the ore extracted has proved the character of it equal to any that has ever been encountered in this county.

LAKE COUNTY.

The Leadville *Circular* approximates the daily output of the leading mines of Leadville as follows:

Mines.	Tons.	Mines.	Tons.
Miner Boy	—	Frenchman	3
Little Pittsburg	12	Evening Star	130
Chrysolite	30	Henriette	25
Little Chief	15	Robert E. Lee	30
Iron Mine	225	Big Chief	25
Silver Cord-Wave	60	Matchless	40
Catalpa	10	Hibernia	12
Little Ella	20	Dunkin	12
Oro La Plata	50	Carbonate Hill	10
Glass-Pendery	20	Long & Derry	12
Morning Star	130	Climax	0
Argentine	40	Comstock	3
Little Prince	12	Crescent	8
Little Sliver	—	Big Pittsburg	12
Colorado Prince	—	Dyer	2
Florence	2	Etna	10
Amie	0	Agassiz	10
New York	6	Leadville	10
Small Hopes	—	A. Y	100
Robert Emmet	5	Little Missouri	12
Shields	8		
Brian Boru	10	Total tons	1101

FRYER HILL.—Noticing the improved outlook for the mines of Fryer Hill, the Leadville *Democrat* says: Though Fryer Hill was one of the earliest discovered as being productive of ore, and which has since proved to have a vast underground wealth, she is not by any means worked out. To-day, she is making very large shipments of an excellent average-grade ore, and most of her mines are extensively worked and explored, which has been productive of many of the recent finds. Every day we hear of some improvement of the mines located on Fryer Hill. Either one breast or another is showing a wide sheet of ore that the day previously perhaps was poor; the grade has improved to such an extent as to greatly enhance the value of the mine. The ore is generally very free from lead, at least toward the north portion of the hill, and when low-grade or running less than $40, is treated by the milling and lixiviation process, while the richer ores are smelted with great advantage and saving of a large percentage of the silver. The future of Fryer Hill will, as development opens new ground, prove up numerous valuable shoots of ore that are hardly believed to exist at the present time; and moreover, the workings of many of the mines at the present time show ore that will last over a considerable period of time, provided the properties be legitimately mined, that is, by keeping explorations well ahead for the constant discovery of new bodies of ore. The area of worked-out ground is somewhat large, and would cover a great many acres were all the worked-out stopes of Fryer Hill bunched together to make a common section; but there is still a very large amount of territory that has not been prospected at the present time, but which there is every reason to believe would prove productive were the ground opened up and which will be in the course of time. From the recent examination of several of the Fryer Hill mines, the *Democrat* reporter can not but speak most highly of what is doing on the hill and the most satisfactory appearance of many of the mines, and also the large shipments of ore that are made, which is for the most part derived from exploratory workings, only a comparatively small amount of stoping being done, which is a healthy condition for a mine to be in, even if it can only pay expenses and at the same time carry on extensive works. At the present time, Fryer Hill is most prosperous and is productive of considerable ore, which could be increased at some of the mines, while we hear several mines that are leased are doing very well and showing up some fair ore.

CLIMAX.—A small force of men are at work, driving a level from shaft No. 7 north, to connect with the north workings; but very little pay ore is obtained.

DENVER CITY.—Still energetically pushing exploration-work with fair success. The shaft on the Shamus O'Brien is 300 feet deep, at the bottom of which is a bore-hole 40 feet through contact-matter.

DUNKIN.—The Leadville *Democrat* states that this mine is producing a large amount of iron ore daily from the leased portion of the workings, or about an average of 2000 tons per month, all of which is shipped to the American smelter, and from which a fair profit is made. The returns for the last lots have not yet been made up, but it is expected the receipts will be satisfactory. A baby hoister is employed at this mine, and gives great satisfaction. During the lease, immense stopes have been cleared of ore, and some pockets of galena of good grade have been shipped occasionally, but none has been taken out recently.

IRON.—The Leadville *Mining Index* says: The Rock and Dome mines of the Iron Silver Mining Company, on the south side of the gulch, are both doing very well and shipping more than their usual amount of fine lead carbonate ores. The Stone incline, on which work has been in progress for some time, is nearly completed, and before the expiration of the present month the extensive resources of the Stone lode will help to swell the output of the Iron group. On the north side of the gulch, near the road, the Iron Company has also begun extracting ore from two old shafts recently reopened, but the output from this source is not sufficient to cut any material figure in the large shipments daily made from this wonderful group of mines. At the Iron mine proper, the shipments have been considerably reduced, though otherwise the mine presents the accustomed activity. The statements of ore-shipments and values are not to be had at this office; consequently, no estimate on the earnings of the mine or the result of the past month's ore settlements can be given.

LITTLE PITTSBURG.—The Leadville *Democrat* says: The Little Pittsburg is still prospecting much the same as usual. No new developments of ore have been made, but the mine still holds her own in a most satisfactory manner. Most of the ore is hoisted from shaft No. 1 of the New Discovery, and the ore mostly derived from the old workings, numerous little shoots of ore being followed, which give good results. During this month, it is expected about 400 tons of ore will make the total shipments, mostly a sand carbonate that nets about $35 per ton. About seventy men are employed in the mine. On April 1st, the annual report will be presented; and on May 1st, there will be a general election, when it is expected some important business will be transacted in relation to the future development of the mine. It is probable that the south portion of the property will be again opened, and the necessary machinery will be erected if it is decided to open this section. We think such a move of the greatest importance, and from numerous developments around this portion of the carbonate belt recently, the prospect for finding some good ore-body seems most encouraging, and we look forward to seeing the necessary developments made with interest. It is also probable that arrangements will be made to sink the Daly shaft of the Little Chief mine, which is likely to prove the existence of much deeper-seated mineral than that with which we are already acquainted.

ROBERT E. LEE.—The pumps are running regularly and have considerably les-

sened the quantity of water, which now gives but little trouble. The mine is looking well and shipping the usual quantity of ore.

RIO GRANDE COUNTY.

According to the Del Norte *Prospector*, the mines mentioned below are worked as follows:

SAN JUAN CONSOLIDATED.—Driving three tunnels at present, and the plan of development will result in nine drifts from which to extract ore the coming season, instead of one, from which the mill was supplied last season. The two principal cross-cuts will reach the vein within a month, and upon completion of the contracts for these cross-cut tunnels, drifts and uprises on the vein will be in order. The shaft for connecting the two tunnel levels is now down nearly 140 feet, and the connection will be completed by an uprise from the second tunnel level. Drifts will then be pushed in every 60 feet between the two tunnel levels, immediately under the old Montroy workings. Drifts will also be run each way from the point where Bowers and Ander on will cut the lode, from which point, also, an uprise will be made of 60 feet, and drifts run each way therefrom; then a still further uprise, with similar drifts, to within 50 feet of the surface.

GOLCONDA.—The Golconda Company has ordered California mortars and topits for its mill, which will then be a first-class 20-stamper. The second tunnel level is pushed in by contract of 200 feet, which will be followed by a second contract which will put the tunnel 425 feet under cover, cutting three veins, including the one cut by the first tunnel level, which showed such fine free-gold specimens.

ODIN.—The Odin Company has its mill here, and work on the foundation will be commenced as soon as the frost is out of the ground. Its site will be east of the San Juan mill, near the old Schrontz dam; capacity, 25 stamps of 650 pounds each, California mortars, topits, and self-feeders.

SAN JUAN COUNTY.

NIAGARA CONSOLIDATED.—The manager, Prof. Theodore B. Comstock, in a letter to the secretary of the company, dated February 23d, says: I am in receipt of a letter from W. G. White, my agent at Eureka, in which he reports the striking of a large body of quartz several days before, which continued to improve constantly, and which gave indications of increasing value of ore. The last shot on January 22d brought out a large quantity of fine ore, and he states that the miners confidently predict a great improvement from this point. This is the cause of the hard rock, the vein-matter having widened greatly, much sooner than I myself had anticipated. They were making less headway, owing to increased hardness due to the more valuable rock. Am confident we can make a dividend this year if my plans are carried out by the company.

GEORGIA.

The Dahlonega *Mountain Signal* says: The gold mines of Georgia for 1881, on the authority of Prof. George Little, Geologist of this State, have yielded 250 per cent on the capital invested, and there is an area for 2,000,000 more of mining lots, which, grasped at once, will cost less than 20 per cent than the cost of mining ground on government lands in the far West. There were on exhibition at the Exposition 283 different minerals from the States of the South. This makes the representation fully 110 larger than ever before exhibited in all the International Expositions held. North Carolina shows fully 200 different minerals. No other like circumscribed area of territory, so far discovered, can produce 125 different minerals. The ores of gold of this State are free milling. Many mills are separating gold from its ores at the cost of 40 cents per ton. The gold-bearing quartz of this State, so far worked, has been mined without the employment of drills and powder. The State yield of gold for 1881 is $6,000,000, yet this branch of mining is in its infancy compared with future work. There are 87 gold mills in operation. The present year will add 100 more; for foreign and Eastern capitalists are on the alert. They have many Rocky Mountain prospectors out purchasing farming lands ostensibly, but who are in reality buying mining ground. Some Cincinnati capitalists are among these shrewd workers. Baltimore, Philadelphia, New York, Boston, and San Francisco also are interested.

MAINE.

Our correspondent "Dirigo" sends us the following notes from Blue Hill, under date of February 17th: The Douglass, under the new management (which took charge January 1st), is working as usual underground, and running one cupola furnace. The Mammoth is putting up a large shaft-house. The Stewart is working as usual, and is putting up a shaft-house. The Blue Hill is working a large force underground, but not doing any smelting at present. The Twin Lead is working as usual. The Granger shut down some months ago. The company has since reorganized on the limited assessmnet plan, but has not yet resumed work. The furnace at Katahdin Iron-Works, after a suspension of about six weeks for repairs, was blown in in July, the first "cast" being made the evening of July 22d. A good business has since been done, but I am unable to give the total amount of iron produced. It is intended to put in 15,000 cords of wood this winter for the use of the works. The Bangor & Katahdin Iron-Works Railroad, which is to connect the works with the Bangor & Piscataquis Railroad at Milo, is now running to Brownville, six miles from Milo Junction. Cars will probably run to the works in July, or early in August at latest. The length of the road will be about 19 miles.

MONTANA.

SUMMIT VALLEY DISTRICT.

The operations of the mines of this district for the week ended the 11th inst. are recorded in the Butte *Miner* as follows:

ALICE.—Nothing new to be said of the condition of this mine. The new shaft of the Magna Charta is pushed steadily down. The north vein on the 400-foot level has now been cut into about four feet, the ore averaging $56 to the ton.

MORNING STAR.—Operations are progressing steadily at the Morning Star. The west drift on the 210-foot level is pushed steadily, and is now in about 166 feet. The ore-body is said to be looking better than for some time past.

MOULTON.—The Cornish pumps will be in position probably by the 15th, and steam will be got up at once. In the mean time, the heavy flow of water along the main vein on the 400-feet level, which some months ago necessitated the stoppage of work on that level, has somewhat ceased, and cross-cutting was begun again. On the 10th, two feet of good ore was cut in the vein on the 400-foot level. This is supposed to be the main or south vein; but whether it is or not, can easily be tested finally, after the pumps have uncovered the 500-foot level and a cross cut has been run sufficient distance south there. Four hundred and thirty-seven pounds of Moulton bullion were shipped during the past week, going about 920 fine. From 40 to 50 tons are milled per day, of which ten or twelve now come from the Wabash. Work in the mine has been prosecuted during the past week as usual on the 200 and 300-foot levels.

NEVADA.

COLUMBUS DISTRICT.

Official reports of February 11th are as follows:

MOUNT DIABLO.—The east drift on the third level has advanced 13 feet, and is showing more favorable vein-matter, it being rotten quartz intermixed with chloride. The stopes above this drift look very well and are yielding considerable ore of a good grade. The stope below the north cross-cut from the west drift on the same level shows very well. In this drift, an advance of 15 feet has been made, and it has a number of small streaks of chloride in the face. The west drift on the second level is giving some $150 ore from a small streak that appears well. The east drift shows no marked change. The stope on the first level continues to look well and is yielding very good ore.

NORTHERN BELLE.—Thirteen feet have been added to the depth of the main shaft during the week. The total distance made since sinking commenced has been 50 feet. The fourth shaft level continues to look well, and the ore upon which sinking is done in the drift run from the 25-foot winze shows an average grade of $70 per ton. Good progress is made in sinking the main winze from this level. It is now down 57 feet on an incline, and shows the same formation as last reported. There is no change in the other shaft levels. A very important development has been made during the week in the west part of the mine. It is on the tenth level, where some very fine ore has been opened into, which so far as proved shows an average width of four feet, and looks very promising. At this point, the facilities for extraction are quite limited, but a cross-cut is running which will reach the ore in about a week and make its extraction quite easy. The other levels above the adit present about the same appearance as at time of last report. The daily yield of ore has been about 61 tons. Mill No. 1 started up on the 1st instant, and is running half-time on Mount Diablo ore. Mill No. 2 is doing usual work on Northern Belle ore. Shipments on February account to February 9th, $16,353.43.

THE COMSTOCK LODE.

The Gold Hill *News* of the 15th inst. says: The promising outlook of a week ago for the Gold Hill mines does not exist to-day. The large and unexpected flow of water struck in the Exchequer mine has caused work to be suspended not only in that mine, but in Alpha and Imperial as well. Even Yellow Jacket has been compelled to cease operations underground. There is no one employed at the latter mine but engineers and pump-men. The combined flow of water from all the Gold Hill Group has been too much for the pumps of that mine, and the water has risen to the 2828 level. The Belcher pump was not started this morning; but when it does begin, it is expected the water will be kept stationary until the flow decreases. Those conversant with mining affairs believe, from the nature of the flow, that a pocket or chamber of water has been tapped. If such is the case, the flow will naturally abate, and it will be but a matter of time when the lower levels of the Yellow Jacket will be in working condition. There is no intention of ceasing pumping at the Yellow Jacket, as has been stated. Should the water rise sufficiently to run into Belcher, it can not interfere with the taking out of low-grade ore from that mine and the Crown Point, as all of the work is above the 2500 level. There was a silly rumor started Monday that the Overman, Caledonia, Crown Point, and Belcher mines were going to shut down, and that, in consequence, the Alta would be flooded. It only needs to be stated that Alta is not connected with any of those mines in any way. Besides, there is no present intention of closing the mines named. The ore reported as having been discovered last Saturday in the Union Consolidated and Mexican mines has not been prospected in the least since that time. Work ceased at those points when Superintendent Patton went to San Francisco. He returned this morning, and work will be resumed, which will make the next few days interesting to stockholders of those mines.

UTAH.

SILVER REEF DISTRICT.

The Silver Reef *Miner* has the following:

BARBEE & WALKER.—A new shaft is sinking on the ledge from the surface at a point 235 feet south from the main incline, which is now down 40 feet; the face is in a strong 4-foot ledge of $50 ore. This shaft will be driven to a connection with the second level south. The winze at the extreme north end of the second level north continues in good ore. Winze 5, on the fourth level north, is down 60 feet, and shows a 2-foot ledge of high-grade ore the entire depth. The back ledge has been cut on the fifth north level, and a drift on the ledge is pushed north with three eight-hour shifts, with very satisfactory results. Cross-cut No. 6 is driven ahead with two shifts, and is expected to cut the ledge in 15 or 20 feet, when it is fully expected a bonanza will be encountered. Prospecting continues in other parts of the mine, and ground is opening well in advance of some immediate requirements. The company's mill was shut down eight days during last month, on account of the freezing up of the water supply pipes, and resumed on the first. No further trouble is anticipated from that source at present.

LEEDS.—The mine and mill were closed down for about two weeks, in consequence of a serious break to the mill machinery; this has now been repaired, and operations have been resumed. The mine is producing an abundance of fair-grade ore, which is worked to a high percentage by the dry process.

STORMONT.—So far during the present year, this company has made an excellent record, and the indications all point to a future of unequaled prosperity. The lower workings in the Buckeye continue in excellent ore; the stopes in the fourth levels, both north and south, are yielding handsomely, and have at no time showed to better advantage. The third level south is pushed ahead into the Last Chance ground, and continues in four feet of good mill-ore, and has now less than fifty feet to make to reach the localities—at some two hundred feet greater depth—of the rich and extensive ore-bodies that made that mine so deservedly famous. The third level north will be extended 250 feet; a contract has just been let for the first 50 feet, and work has begun. This will make available a very large block of bonanza ground which has been proved by the second level directly above, for that distance. The ore-reserves now in sight on both the third and fourth levels may be safely estimated sufficient for a six months' mill-run. A uniform output of about 50 tons per day is maintained, which is raised principally through the Savage shaft. Two new pans have just been placed in the company's mill, which has been running uninterruptedly for the past seven months.

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

This department is opened for the benefit of miners, prospectors, and others interested in minerals.

Replies will be made in these columns, and *without charge*, to questions asked regarding the nature and commercial value of minerals, and of samples sent.

Assays, determining the actual composition and value of ores, will be made at the following rates. All assays are made with the utmost care by the most experienced and competent assayers:

Assay for gold	$3.50	Assay for copper	$3.00	Assay for iron	$4.00
" silver	3.00	" lead (wet)	3 00	" nickel and	
" gold and silver	5.00	" zinc	5.00	cobalt	10.00

The amount should invariably accompany the order, and expressage or postage must always be prepaid.

Communications, samples, etc., to be addressed to

ENGINEERING AND MINING JOURNAL, 27 Park Place, New York

(P.O. Box 1883).

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Feb. 24.

There has been a business of 1,088,928 shares, and prices have been weak as a rule. The Leadville stocks have recovered some from the raid made a week ago. Some think they see prospects of an improvement soon, but we think the mines will have to do something in the way of remarkable development to improve the situation much.

The Tuscarora stocks have been very quiet and without feature.

There has been a moderate amount of business in the Comstock shares at weak prices. California sold at 7@11c., assessment unpaid, and 40@25c., assessment paid. Consolidated Virginia sold at 56@30c., assessment unpaid, and at 75c. to-day, assessment paid. Sutro Tunnel had a moderate amount of business at 75@63c. The other stocks were all weak and considerably neglected.

Alice has been weak and quiet, selling at $2.90@$2 75. Amie was very active, selling up to 28c. on Monday, and back to 22c. to-day; the sales aggregate 101,150 shares. Chrysolite has been quiet at $4.25@$3.85@$4. Green Mountain has held its own at $2.10@$2.05. Horn-Silver, under a moderate business, has been a little weak, selling from $16⅝ down to $14.

Iron Silver has been very active and a little weaker; the sales aggregate 13,500 shares at $2.30 @$2.10. Little Chief has had a business of 11,800 shares at 93c.@$1. Robinson Consolidated has been very active and much stronger on more encouraging reports from the mine; the sales aggregate 181,630 shares at $2.45@$3.25. Advance records a business of 10,200 shares at 52@55c. Bradshaw ranged between 40@44c., with sales of 14,100 shares. Central Arizona declined from $1⅛@$1, on sales of 5200 shares. Durango declined from 38@30c., with sales of 9400 shares. Empire advanced from $1.25@$2 under a business of 5800 shares. Oriental & Miller ranged between 20@24c., with a business of 24,000 shares. Rappahannock sold at 27@33c. Silver Cliff sold at $2.15@$1.95, with a business of 6600 shares. South Pacific records sales of 125,415 shares at $3@$2.50. State Lines Nos. 1 and 4 have been quiet and weak, selling down to 15c. to-day. Nos. 2 and 3 have been very active although quite weak, the sales aggregating 235,650 shares at 80@68c. Taylor-Plumas has been active, selling at 45@85c., with a business of 27,500 shares.

Bodie has been quiet and irregular, selling at $3@$4 @$3.20. Standard only records sales of 225 shares at $17@$16.

The Victoria Consolidated Silver Mining Company (Limited), of Canada, was organized during the year with a capital of $400,000. On the 13th of June, the mine was free from water and sinking was resumed. At the annual meeting held on January 31st, 1882, it was reported that the engine-shaft had been sunk 80 feet, and that it had attained a depth of 310 feet. From the 230-foot level, there had been driven a cross-cut of 18 feet east to the foot-wall. At the 235-foot level, 36 feet were driven south on the course of the vein, and 34 feet north. The developments in the mine are reported to be of a most satisfactory character. It is estimated that there are from 800 to 1000 tons of ore on the dump. The completion of a concentrating mill is delayed awaiting the further development of ore. This company claims among its stockholders some of the best names in Canada.

DIVIDENDS.

The Evening Star Mining Company has declared a dividend (No. 32) of 5 per cent on the capital stock, also dividend (No. 33) of the same amount, making a total of 10 per cent, payable February 25th. Transfer-books closed on the 23d.

The Renfrew Consolidated Gold Mining Company, of Nova Scotia, has declared its second monthly dividend of one per cent.

The Socorro Milling and Mining Company has declared a dividend of one per cent upon its capital stock out of January net earnings, payable on and after February 15th.

UNLISTED QUOTATIONS.

Mr. L. V. Deforeest, No. 70 Broadway, under date of February 24th, 3 P.M., reports the current quotations of unlisted stocks as follows:

	Bid.	Off'd.		Bid.	Off'd.
Colum. & Beaver	$0.50	$0.60	Highland Chief		$1.75
Eagle	....	2.00	Hite	....	1.75
Harlem	1.20	1.30	Menlo.....	....	2.00
Hall-Anderson...	1.00	2.00	Satemo.....	....	1.25

REVIEW OF THE SAN FRANCISCO MARKET.

The San Francisco market continues in the same state of depression which has been noted for some time past, and there are no indications of any immediate change for the better. That there is still a strong confidence in the future of the north end stocks is shown by the readiness with which the stockholders of the Sierra Nevada paid their last assessment, only $7000 out of $100.000, according to a San Francisco exchange, being delinquent. These stocks have weakened a little during the week; in fact, the only stock on the list that shows any decided advance is Martin White, which was quoted yesterday at $5⅛ as against $4 a week ago.

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, Feb. 23.

The market for copper stocks seems to have lapsed into a chronic state of dullness and inactivity, and prices show no signs of improvement in the near future. With one or two exceptions, the whole list is neglected, and there is little disposition to trade in any thing. The silver stocks are, if any thing, duller than ever; the week's sales would not make up a good average day's work. Calumet & Hecla and Quincy are the exceptions of the coppers; the former showing an advance of $2¼, and the latter advanced from $103@$43, closing to-day $42½. Franklin, which declined last week to $10½, was in little better demand, and records an advance to $11¼. Pewabic declined from $13½@$12¼, and Atlantic declined to $13⅜. Phœnix was steady at $3¾ early in the week, but declined to-day to $3⅛. Osceola opened at $31, and declined to $30. Huron sold at $2½@$2⅝; National, at $2@$2⅛; Ridge, at 75@50c. Brunswick Antimony declined to $14.

In silver stocks, Harshaw declined from $3⅜@$3. Bonanza from $4⅞@$4¼. Silver Isle from $20@$18. Sullivan sold at $1⅞ @$2. Catalpa at 55c.

At the Boston Mining and Stock Exchange, there has been a fair degree of activity, and better prices for some specialties were made in the early dealings, most of which, however, have been lost the past two days. Milton advanced from 9@15c., but again declined to 9c. to day, and closed dull at that. Empire declined from 51@46c. Twin Lead has been very active, opening at 14c. and advanced to 21c., but followed the market to day and receded to 12c.; about 25,000 shares changed hands. War Eagle advanced from 63@75c., closing at 70c. Massachusetts & New Mexico steady at 22@23c. Cumberland advanced from 68@ 70c.

3 P.M.—The market this afternoon is dull and lower. Franklin sold at $11; Calumet & Hecla at $231, closing $230 bid; Phœnix sold at $3; Allouez at $2⅝@$3; Atlantic, $14 asked; Pewabic, $11½@$12½; Quincy, sales at $42⅛ and bid; Silver Islet, $18 bid; Ridge, 50c. bid. Catalpa sold at 63c.

Coal Stocks.

NEW YORK, Friday Evening, Feb. 24.

Opening strong, these stocks were in good demand

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	SHARES. No. in 1000's	SHARES. Par Value.	ASSESSMENTS. Lev'd to date in 1000's.	ASSESSMENTS. Date and amount per share of last.	DIVIDENDS. Total paid to date in 1000's.	DIVIDENDS. Date and amount per share.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22. H.	Feb. 22. L.	Feb. 23. H.	Feb. 23. L.	Feb 24. H.	Feb 24. L.
Alice, Mon..	460	25	*	.....	40	De 81 10	2.90	.....	.....	.....	2.8	2.75	.....	.....	2.85	2.75	.....	.....
Amie Con., Co.	500	10	*	.....	305	My 81 10	.17	.16	.28	.23	.27	.24	.....	.....	.24	.22	.25	.22
Argenta, Ne.....	100	100	140	Se 81 10	40	Fe 80 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bar & Walker, Ut.	100	10	*	.....	60	No 80 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bassick, Co.	100	100	*	.....	25	Fe 80 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie Isle, Ne. ..	100	100	55	Se 81 10	300	De 79 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Black Bear, Ca...	30	100	15	Se 79 50	830	De 81 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belcher, Ne.....	104	100	2340	Se 81 1 00	15397	Ap 76 75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bodie Cons., Ca...	100	100	125	De 81 50	1200	Mr 80 25	3.20	3.00	4.00	.....	.....	.....	.....	.....	3.00	.....	3 85	3 20
Breece, Co.....	200	25	*	.....	2	Fe 80 1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bulwer Ca.....	100	100	30	De 77 50	30	Fe 82 10	2 30	2.25	.....	.....	.....	.....	.....	.....	.....	.....	2 30	2.20
California, Ne....	540	100	270	Ja 82 20	31320	De 79 50	.11	.07	.40	.10	.35	.32	.....	.....	.34	.32	.32	.25
Cal. & Hecla, Mch.	10	25	..	.....	2 0350	No 81 5 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Caribou Con., Co.	100	10	*	.....	50	Mr 81 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Catalpa, Co.....	300	10	*	.....	180	My 81 2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chrysolite, Co....	200	50	*	.....	16 0	De 81 50	4.25	3.90	.....	.....	4.05	2.85	.....	.....	4.10	4.00	4.00	.....
Climax, Co.....	200	10	*	.....	180	Au 81 30	.....	.....	.40	.35	.56	.....	.....	.....	.....	.....	.30	.....
Cons. Va. Ne.....	540	100	735	Ja 82 30	42230	Au 81 50	.56	.53	.57	.46	.55	.51	.....	.....	.52	.48	.75	.30
Copper Knob, N.C.	1000	1	*	.....	15	No 80 02	.02	.....	.02	.....	.02	.....	.....	.....	.02	.....	.....	.....
Copper Queen, Ar.	250	10	*	.....	250	Ma 82 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crown Point, Ne.	100	100	2573	Se 81 75	11588	Ja 75 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
D'dw'd-Terra, Dk	200	25	*	.....	4590	Fe 82 15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Co.....	200	25	*	.....	200	Ju 81 7½	.....	.....	.54	.....	.53	.50	.....	.....	.55	.49	.55	.53
Eureka Cons., Ne.	50	100	100	My 76 1 00	4730	Se 81 50	12.00	.....	.....	.....	12.00	.....	.....	.....	.....	.....	12.50	.....
Evening Star.....	50	10	.....	.....	650	Ja 82 1 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Excelsior, Ca.....	100	100	300	Ja 82 1 00	850	Se 80 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Exchange, Ne.....	100	10	*	.....	15	 03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fa. de Smet, Dk..	100	100	*	.....	390	Fe 82 25	.....	.....	6.75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Findley, Ga.....	200	1	*	.....	8	My 79 1c	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Freeland, Co....	200	25	*	.....	50	Se 81 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gem, Co.....	.....	.....	.....	.....	4	De 81	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Glass-Pend., Co..	250	20	*	.....	25	My 81 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Stripe, Ca..	150	10	*	.....	70	Jy 81 15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
G'ld & Curry, Ne.	108	100	3368	Ja 82 50	3826	Oc 70 80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gould & Prize, Ne.	100	100	540	Oc 81 25	450	Se 80 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Great Eastern, Dk	300	1	*	.....	16	Jy 80 01	.08	.....	.....	.....	.08	.....	.....	.....	.....	.....	.08	.07
Gr. Mountain, Ca.	125	10	*	.....	212	No 81 7½	2.10	.....	2.10	2.05	.....	.....	.....	.....	2.05	.....	2.05	.....
Hale & Nor., Ne..	112	100	3838	De 81 75	1588	Ap 71 ½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hibernia, Co....	300	25	*	.....	180	Jy 81 10	.17	.16	.17	.15	.18	.16	.....	.....	.17	.16	.17	.....
Homestake Dk..	100	100	200	Ap 78 1 00	1260	Fe 22 30	.....	.....	19.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horn-Silver, Ut..	400	25	*	.....	840	Fe 82 75	16.25	.....	16.38	.....	15.75	.....	.....	.....	15.25	15.00	14.88	14.00
Hukill, Co.....	200	5	*	.....	210	De 78 10	.66	.....	.66	.....	.....	.....	.....	.....	.67	.....	.....	.....
Idaho, Ca.....	3100	100	.....	.....	3102	Ja 82 7 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Independ., Ne.....	100	100	170	Au 81 15	225	Se 79 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
In. Queen, Ne....	125	2	.....	Fe 80 15	288	Se 81 05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Inyo, Ca.....	100	5	*	.....	40	De 81 05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iron Silver, Co..	500	20	*	.....	500	De 81 20	2.30	2.15	2.20	2.10	2.15	2.10	.....	.....	2.20	2.10	2.15	2.10
Joculistita, Mex..	100	100	.....	.....	200	Fe 82 1 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
La Plata, Co.....	200	10	*	.....	450	Fe 82 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leadville C., Co..	400	10	*	.....	170	De 81 05	.....	.....	.....	.....	.....	.....	.....	.....	.64	.....	.....	.....
Ledo, Ut.....	100	100	51	Je 81 25	78	Oc 78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief, Co..	200	50	*	.....	700	Au 80 50	1.00	.93	1.00	.....	1.00	.93	.....	.....	1.00	.99	1.00	.97
Little Pitts., Co..	200	100	*	.....	1350	Mr 80 50	1 65	1.50	1.65	.....	1.60	.....	.....	.....	1.60	.....	.....	.....
Martin White, Ne	100	100	900	Ja 82 25	90	Jy 79 50	3.5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moose, Co.....	200	10	4	.....	550	Mr 78 25	.96	.93	.99	.95	1.05	.97	.....	.....	.98	.....	.90	.94
Navajo, Ne.....	108	100	200	De 81 15	25	Mr 81 25	.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y. & Colo., Col.	50	20	*	.....	25	Jy 79 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N'h'n Belle, Ne..	50	100	.....	.....	2 88	De 81 75	.....	.....	.....	.....	10.00	.....	.....	.....	.....	.....	10 00	.....
N. Belle Isle, Ne..	100	100	25	Fe 80 15	30	Au 81 15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.18	.....
Ontario, Ut.....	150	100	.....	.....	4225	Ja 82 50	.....	.....	35 0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ophir, Ne.....	100	100	3.92	Mr 81 1 00	1603	Ja 8 1 00	4.75	.....	5.00	4.75	.....	.....	.....	.....	.....	.....	4.13	.....
Osceola, Mich....	50	25	..	.....	610	Oc 81 1 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Plumas, Ca.....	100	10	*	.....	151	Jy 79	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quicks. Pref., Ca.	48	100	.....	.....	396	Au 81 9 25	60.00	.....	.....	.....	.....	.....	.....	.....	60.00	57½	.....	.....
" Com., Ca.	57	100	.....	.....	128	Au 81 2 25	13.00	.....	13.13	.....	12.50	.....	.....	.....	12.00	.....	.....	.....
Quincy, Mich.....	40	25	.....	.....	3030	Fe 82 8 0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rising Sun, Ca...	150	5	*	.....	52	My 81 7½	.65	.54	.61	.50	.51	.50	.....	.....	.....	.....	.....	.....
Robinson Con., Co.	200	50	*	.....	575	No 81 50	2.60	2.50	2.70	2.50	2.65	2.45	.....	.....	8.1	2.63	3.25	2.90
Robt. E. Lee, Co.	5 10	500	.....	.....	50	Jy 81 1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Savage, Ne.....	112	100	5496	Ja 82 5	4460	Ju 81 3 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sierra Nevada, Ne.	100	100	4800	De 81 1 00	102	Ja 7 1 0	7.50	.....	7.50	7.25	.....	.....	.....	.....	7.50	7.00	6.88	6.75
Silver King, Ar...	100	100	.....	.....	800	De 81 25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Co...	500	2	.....	.....	50	Au 81 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spring Valley, Ca.	200	1	*	.....	50	Ja 81 25	.....	.....	.....	.....	4.00	.....	.....	.....	.....	.....	.....	.....
Standard, Ca.....	100	100	50	Jy 78 1 00	8375	Ja 82 75	17.00	.....	.....	.....	.....	.....	.....	.....	16½	16.00	.....	.....
Starr-Grove, Ne..	300	10	*	.....	16	Ju 81 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Stormont, Ut....	200	1	*	.....	155	No 81 05	1.00	.....	.95	.....	.95	.....	.....	.....	.....	.....	1.00	.....
St. Joseph, Mo....	100	10	*	.....	290	De 81 20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tip Top, Ar	100	100	120	Mr 80	100	No 81 20	.....	.....	4.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tombstone, Ar...	500	25	*	.....	1100	Ja 82 10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vizina, Ar.....	200	25	.....	.....	80	De 81 10	2.80	2.75	2.80	2.70	2.80	2.75	.....	.....	2.75	.....	2.65	.....
Yel. Jacket, Ne...	120	100	4150	Oc 81 1 00	2184	Au 71 2 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.....

SALES.—Alice, 1100; Amie Consolidated, 101,150; Bodie Consolidated, 790; Bulwer, 350; California, 12,120; Chrysolite, 1850; Climax, 2100; Consolidated Virginia, 9985; Copper Knob, 13,100; Dunkin, 6800; Eureka, 170; Father De Smet, 200; Great Eastern, 3100; Green Mountain, 1300; Hibernia, 12,500; Homestake, 100; Horn-Silver, 1435; Hukill, 500; Iron Silver, 13,500; Leadville, 200; Little Chief, 11,800; Little Pittsburg, 613; Martin White, 200; Moose, 15,600; Navajo, 100; Northern Belle, 200; North Belle Isle, 200; Ontario, 100; Ophir, 420; Quicksilver, preferred, 800; common, 900; Rising Sun, 5800; Robinson Consolidated, 181,630; Sierra Nevada, 1140; Spring Valley, 10; Standard, 225; Stormont, 740; Tip Top, 200; Vizina, 1300; Yellow Jacket, 400. Dividend shares sold, 404,728.

NON-DIVIDEND PAYING MINES.

NAME AND LOCATION OF COMPANY.	NUMBER OF SHARES.	Par.	ASSESSMENTS. Total levied to date.	ASSESSMENTS. Date and amount of last.	HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22. H.	Feb. 22. L.	Feb. 23. H.	Feb. 23. L.	Feb. 24. H.	Feb. 24. L.
Advan'e M.&M.Co	.....	.....	.....	.....	54c	53c	54c	52c	53c	.....	.....	.....	55c	53c	55c	53c
Albion, s. L	Nev.	150,000	100	330	Nov. 81	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aliouez	Mich	.....	.....	.....	.....	.....	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta	Nev.	100,800	100	1,584,000	Dec. 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alta-Montana, G	Mon.	500 000	10	*	.....	..	1.80	1.70	.....	.....	1.80	1.75	.....	.....	1.75	.....
Am. Flag, s	Col	125,000	10	*	.....	..	..	.....	11c	.....	.....	.....	.....	.....	.....	.....
Atlantic Copper	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bald Mountain, G	Colo	1,000,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barcelona, G	Nev	200,000	25	*	.....	..	20c	18c	20c	19c	20c	19c	.....	.....	20c	19c
Battle Creek	Dak.	200,000	25	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bear Creek	Colo	300,000	1	.....	.....	..	1.80	1.50	1.60	1.55	1.55	.....	.....	.....	1.45	1.50
Beauce G'd M.M.C	.....	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Becntel Con., G	Cal.	100,000	100	102,750	Dec. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Best & Belcher, G. s	Nev.	100,800	100	1,053,730	Jan. 82	50	6.75	.....	6.88	6.75	.....	.....	.....	.....	6 88	6.75
Big Pittsburg, s. L	Colo	200,000	100	*	.....	..	.....	.....	.....	.....	1.60	60c	.....	.....	.....	.....
Black Jack, G	Cal.	100,000	2½	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza Chief	Mon	1,000,000	1	*	.....	..	6c	5c	.....	.....	.....	.....	5c	.....	.....	.....
Bondholder	Colo	200,000	2½	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston Con., G	Cal.	100,000	100	50,000	Sept. 81	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boulder Con., s	Colo	200,000	10	.....	.....	..	3c	.....	.....	3c	.....	.....	.....	.....	.....	.....
Bradshaw, s	Ariz	225,000	10	.....	.....	..	41c	40c	42c	40c	41c	.....	.....	.....	44c	40c
Buckeye	Colo	400,000	5	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	3c	.....
Bull-Domingo, s L	Colo	200,000	50	*	.....	..	25c	.....	.....	25c	.....	.....	.....	.....	.....	26c
Bullion, G. s	Nev.	100,000	100	3,892,000	Jan. 82	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bye and Bye	Ariz	100,000	10	*	.....	..	.....	.....	6c	.....	6c	5c	6c	.....	.....	.....
Calaveras, G	Cal.	500,800	1	*	.....	..	12c	11c	.....	.....	12c	.....	.....	.....	.....	11c
C'lav'r's W.&M.Co	Cal.	.....	.....	.....	.....	..	50c	.....	50c	.....	.....	.....	.....	.....	.....	.....
Cal., B. H., G	Dak.	100,000	100	400,000	Mar. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	99c
Carbonate Hill, s L	Colo	400,000	10	.....	.....	..	.....	.....	27c	.....	30c	27c	.....	.....	33c	30c
Catskill, s	Nev.	300,000	5	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Central Ariz'na, s	Ariz	100,000	100	.....	.....	..	1.10	1.05	1.13	1.00	1.10	1.05	.....	.....	1 05	1.00
Chapparal	Cal.	.....	.....	.....	.....	..	.....	.....	.....	.....	3c	.....	.....	.....	.....	.....
Cherokee, G	Cal.	150,000	10	.....	.....	..	43c	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cheyenne Con., G	Dak.	300,000	1	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Clarence	Can.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Colorado Cent'l, s	Colo	300,000	10	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col'mb'a Con., G. s	Nev.	100,000	50	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Imp'r'l, G. s	Nev.	500,000	100	1,425,000	Jan. 82	10	10c	.....	8c	.....	10c	.....	.....	.....	.....	7c
Con. Pacific, G	Cal.	60,000	100	114,000	Jly 81	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Pay Rock, s	Colo	250,000	1	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crescent, s L	Colo	300,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crowell, G	N. C.	50 ,000	1	.....	.....	..	8c	.....	8c	7c	8c	.....	.....	.....	8c	7c
Dahlonega, G	Ga.	250,000	1	*	.....	..	5c	.....	5c	.....	.....	.....	.....	.....	.....	.....
Dardanelles, G	Cal.	100,000	10	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunderberg, s	Colo	150,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Durango, G	Dak.	500,000	1	*	.....	..	38c	35c	31c	30c	35c	30c	.....	.....	35c	32c
Empire, s	Ut'h	100,000	100	.....	.....	..	1.30	1.25	1.35	1.25	1.35	1.25	.....	.....	1.65	1.50
Enterprise	Colo	.....	.....	.....	.....	..	.....	.....	82c	79c	83c	81c	.....	.....	82c	81c
Exchequer	Nev.	100,000	100	655,000	Jan. 82	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Globe Copper	Ariz.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	67c	60c
Glynn Dale Con., s	Cal.	100,000	100	75,000	Jan. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gold Placer, G	Colo	200,000	25	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Goodshaw, G	Cal.	100,000	100	145,000	Feb. 81	15	45c	40c	45c	43c	45c	44c	.....	.....	.....	.....
Granville, G	N. C.	300,000	1	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	3c
Harshaw, s	Ariz	100,000	100	.....	.....	..	3 30	3.20	3.30	3.25	3.35	3.20	.....	.....	.....	.....
Head Center, s	Ariz	100,000	100	55,000	May 81	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hortense, s	Colo	200,000	10	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Index	Cal.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Julia, G s	Nev.	110,000	100	.....	Jan. 82	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kossuth, G s	Nev.	108,000	100	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lacrosse, G	Colo	100,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Legal Tender, s L	Colo	200,000	5	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leviathan, s	Nev.	100,000	100	350,000	Mar. 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lucerne, s	Colo	500,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malachite	Nev.	200,000	5	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mariposa Pref., G	Cal.	50,000	100	1,437,500	Dec. 81	..	.....	.....	40c	.....	45c	.....	.....	.....	42c	.....
" C m., G	Cal.	100,000	100	1,450,000	Dec. 81	..	.....	.....	.....	.....	48c	20c	.....	.....	.....	58c
May Belle, G	Cal.	100,000	100	126,000	Dec. 81	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mayflower, s	Colo	100,000	100	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mexican, G. s	Nev.	100,800	100	1,600,800	Sept. 81	81	9.25	.....	.....	.....	.....	.....	.....	.....	.....	9.00
Michoacan Synd.	Mex.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mineral Creek, s	Ariz	200,000	10	*	.....	..	.....	.....	.....	.....	4c	3c	.....	.....	.....	4c
Miner Boy, G s L	Colo	5 0,000	10	*	.....	..	9c	8c	9c	7c	9c	.....	.....	.....	9c	8c
Miller	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mono, s	Cal.	50,000	100	400,000	Dec. 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Moose Silver, s	Colo	300,000	10	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nevada Syndi	.....	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Standard, G	Cal.	100,000	100	.....	Nov. 81	10	.....	.....	.....	.....	20c	17c	.....	.....	30c	23c
North State	N. C.	400,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Horn-Silv'r, s L	Utah	400,000	10	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Noonday	Cal.	400,000	100	.....	Jne 81	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Old Dominion, G	Ariz	200,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ori'nt'l & Miller, s	Nev.	400,000	25	.....	.....	..	21c	20c	23c	20c	24c	21c	.....	.....	23c	21c
Overman, G s	Nev.	115,200	100	3,458,300	Jan. 82	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Quartz Creek	.....	.....	.....	.....	.....	..	39c	.....	40c	35c	.....	.....	.....	.....	.....	.....
Rappahannock, G	Va	250,000	1	*	.....	..	29c	27c	28c	.....	28c	.....	.....	.....	31c	29c
Red Elephant, s	Colo	500,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Pedro, G s L	N. M	400,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Cliff, s	Colo	200,000	30	*	.....	..	2.15	2.05	2.05	2.00	2.00	.....	.....	.....	2.15	2.00
Silver Islet	Can.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Nugget, s	Ariz	200,000	10	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silv'r N, n'w stk, s	Ariz	250,000	10	.....	.....	..	.....	.....	9c	8c	8c	.....	.....	.....	.....	8c
Sonora Con	Mex.	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bodie, G	Cal.	100,000	100	85,000	Nov. 80	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Bulwer, G	Cal.	100,000	100	195,000	May 81	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Hite	Cal.	100,000	5	.....	Jan. 82	10	.....	.....	17c	15c	16c	.....	.....	.....	16c	.....
South Pacific	Cal.	.....	1	.....	.....	..	2.75	2.50	3.00	2.50	3.25	2.60	.....	.....	2.70	2.50
State Line No. 1, s	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" No. 2, s	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" No. 3, s	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" No. 4, s	Nev.	200,000	25	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" Nos. 1 & 4, s	Nev.	.....	.....	.....	.....	..	19c	15c	19c	17c	18c	16c	.....	.....	18c	17c
" Nos. 2& 3, s	Nev.	.....	.....	.....	.....	..	79c	65c	80c	73c	74c	68c	.....	.....	76c	69c
Sutro Tunnel	Nev.	2,000,000	10	*	.....	..	75c	69c	71c	70c	72c	65c	.....	.....	72c	63c
Tabor Mine	Colo	250,000	20	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Taylor Plumas	.....	.....	.....	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tioga, G	Cal.	100,000	100	260,000	Jan. 82	10	45c	17c	53c	50c	52c	63c	.....	.....	75c	68c
Tuscarora, s	Nev.	100,000	100	95,000	Apr. 81	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unadilla, s	Colo	500,000	1	*	.....	..	.....	.....	.....	.....	10c	.....	.....	.....	11c	10c
Union Cons, G. s	Nev.	100,000	100	1,160,000	Jly 81	81	.....	.....	.....	.....	10.25	.....	.....	.....	10.63	10.38
Utah	Nev.	29,000	100	1,210,000	Jan. 82	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vandewater, s	Nev.	200,000	10	*	.....	..	29c	27c	30c	28c	29c	.....	.....	.....	34c	33c
Washington, s	Ariz.	200,000	5	.....	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Willshire, G	Cal.	50,000	1	*	.....	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

SALES.—Advance M. & M. Co., 10,200; Allouez, 75; Alta-Montana, 2400; American Flag, 100; Barcelona, 12,100; Beauce Gold M. & M. Co., 25,100; Best & Belcher, 900; Big Pittsburg, 600; Bonanza Chief, 700; Boulder Consolidated, 2200; Bradshaw, 14,100; Buckeye, 200; Bull Domingo, 2600; Bye and Bye, 5700; Calaveras, 1410; Calaveras W. & M. Co., 2300; California, B. H., 200; Carbonate Hill, 1300; Central Arizona, 5200; Chapparal, 3500; Cherokee, 100; Consolidated Imperial, 3500; Crowell, 8000; Dahlonega, 1600; Durango, 9400; Empire, 5800; Enterprise, 6800; Globe Copper, 7800; Goodshaw, 4900; Granville, 1000; Harshaw, 7800; Mariposa, preferred, 700; common, 1100; Mexican, 150; Mineral Creek, 7000; Miner Boy 39,800; North Standard, 1000; Oriental & Miller, 24,000; Quartz Creek, 1100; Rappahannock, 4600; Silver Cliff, 6000; Silver Nugget, new, 6000; South Hite, 2900; South Pacific, 125,415; State Line, Nos. 1 and 4, 23,800; Nos. 2 and 3, 235,650; Sutro Tunnel, 18,400; Taylor-Plumas, 27,500; Tioga, 150; Unadilla, 4800, Union Consolidated, 200; Vandewater, 5800. Non-Dividend shares sold, 684,200. Total shares sold at all the Exchanges, 1,088,928.

in the early part of the week, but yesterday, in sympathy with the general market, they fell off a few points. The aggregate transactions are not as large as usual, owing to the occurrence of a holiday, but the average daily transactions are about the same. Delaware, Lackawanna & Western declined to $121½, as against $125¾ on Saturday last. Reading has been fairly active and weak, the sales amounting to 88,300 shares at $64⅛@$55½. Delaware & Hudson records sales of 7560 shares at $109½@$107½. New Jersey Central sold from $97½@$91 these being the extreme prices.

SAN FRANCISCO MINING STOCK QUOTATIONS.

Daily Range of Prices for the Week.

NAME OF COMPANY.	CLOSING QUOTATIONS. Feb. 17.	Feb. 18.	Feb. 20.	Feb. 21.	Feb. 22.	Feb. 23.
Alpha	1¾	1¾	.....	1¾	.....	1⅛
Alta	3⅜	3⅜	.....	3¼	.....	3⅜
Bechtel	13-32	.....	.....	.....	.....	.....
Belcher	21-32	11-16	.....	½	.....	½
Best & Bel	6⅜	6¾	.....	6¼	.....	6¼
Bodie	3	3¼	.....	3⅛	.....	3¼
Bullion	11-16	19-32	.....	13-16	.....	11-16
Bulwer	.....	.....	.....	⅜	.....	.....
California	5-32	11-32	.....	5-16	.....	¼
Chollar	1¼	1¼	.....	1⅛	.....	1⅛
Con. Va	9-16	9-16	.....	½	.....	13-32
Crown P'int	9-16	9-16	.....	½	.....	7-16
Eureka Con	.....	12½	.....	13	.....	.....
Exchequer	21-32	11-16	.....	9-16	.....	9-16
Gould &Cur	3⅜	3⅜	.....	3	.....	3
Hale & Nor	1¾	1¾	.....	1½	.....	1½
Manhattan	.....	1½	.....	1½	.....	.....
Mar. White	4	.....	.....	4⅛	.....	5⅛
Mexican	9⅝	9¼	.....	8¾	.....	8⅞
Mono	.....	31-32	.....	1⅛	.....	1
Mt. Diablo	6¼	6¼	.....	7¼	.....	7¼
Navajo	.....	.....	.....	.....	.....	.....
North. Belle	9¼	10¼	.....	9⅝	.....	9¾
Noonday	.....	.....	.....	.....	.....	¼
Ophir	4⅝	4⅝	.....	4¼	.....	4
Oro	3-16	¼	.....	¼	.....	¼
Overman	¾	¾	.....	9-16	.....	9-16
Potosi	1¼	1¼	.....	1	.....	1
Savage	1⅝	1⅝	.....	1⅝	.....	1⅛
Scorpion	¾	27-32	.....	11-16	.....	11-16
Sierra Nev	7¼	7⅜	.....	6¾	.....	6¾
Silver King	18¾	18¾	.....	18¼	.....	18½
Tip Top	.....	.....	.....	.....	.....	.....
Union Con	10⅝	10½	.....	9⅞	.....	10⅛
Wales Con	19-32	½	.....	9-16	.....	½
Yel. Jacket	1⅝	1½	.....	1	.....	1
.....	.....	.....	.....	.....	.....	.....

An important decision has been given by the Philadelphia courts affirming the legality of the deferred bonds. Judge Hageman decides that the company has a perfect right to create debt, borrow money, and issue bonds, and that the issuing of deferred bonds is legal, no matter if the company only agrees to pay interest on the same, without specifying any special time for the redemption of the securities.

Gas Stocks.

The following list of companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 17 Wall street, New York. Quotations are based on the equivalent of $100.

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS. Rate per ann.	DIVIDENDS. Am. of last.	DIVIDENDS. Date of last.	QUOTATIONS. Bid.	QUOTATIONS. As'd.
	$		P. ct.				
Mutual, N. Y.	5,000,000	$100	6	1½	Jan. '82	95	97
" Bonds	900,000	1,000	6	3½	Feb., '82	114	115
N. York "	4 000,000	.....	8	4	Nov., '81	119	121
Metrop. "	2,500,000	100	10	8	Feb., '82	160	166
" Bonds	700,000	.....	3	.....	.....	105	109
Harlem "	1,850,000	50	.....	3	Feb., '78	91	93½
Manhat. "	4,000,000	50	.....	5	Feb., '82	225	230
Brooklyn, Bkln.	2,000,000	50	.....	5	Nov., '81	110	114
Nassau "	1,000,000	25	.....	3	Sept., '81	60	65
" Certfs	700,000	1,000	7	3½	Nov., '81	94	96
People's	1,000,000	10	.....	3½	Jan., '76	25	29
" 1st m. Bonds	400,000	.....	7	3½	Nov., '81	104	107
Bonds	100,000	.....	6	3	Oct., '81	90	95
Metrop. "	1,000,000	100	5	2½	Jan., '82	60	63
W'msb'g "	1,000,000	50	.....	1½	Jan., '82	60	65
" Bonds	1,000,000	1,000	6	3	Oct., '81	101	104
Citizens'	1,200,000	20	.....	2½	Jan., '82	58	60
" Bonds	315,000	1,000	.....	3½	Oct., '81	105	110
J. C., N. J	750,000	20	.....	7½	Jan., '82	150	170
Municipal, N. Y.	2,000,000	100	.....	5	Dec., '81	195	118
" Bonds	750,000	100	7	3½	Nov., '81	105	110
Fult'n M'nicipal	1,500,000	100	.....	.....	.....	75	80

BULLION MARKET.

NEW YORK, Friday Evening, Feb. 24.

Our silver market for the past week has been without a feature worthy of note, and is dull and nominal at the day's quotation.

DATE.	London Pence.	N. Y. Cents.	DATE.	London Pence.	N. Y. Cents.
Feb. 18	52 1-16	114⅜	Feb. 22	.....	*
Feb. 20	52	114⅛	Feb. 23	52	114⅛
Feb. 21	52	114⅛	Feb. 24	52	114⅛

* Holiday.

BULLION PRODUCTION FOR 1882.

We give below a statement showing the latest bullion shipments. These are officially obtained from the companies, where that is possible; and where official statements can not be procured, we take the latest shipments published in those papers nearest to the mines reported. The table gives the amount shipped for the week up to the date given, as well as the aggregate shipments to such date, from the first of January, 1882.

The shipments of silver bullion are valued at $1.29·29 per ounce, Troy; gold at the standard $20.67 per ounce, Troy. The actual value of the silver in the following table is therefore subject to a discount, depending on the market price of silver. If the price of silver be counted at $1.12 per ounce, which has for some months been about its average

value, the following figures, where they relate to silver bullion, should be diminished by about 13½ per cent to arrive at actual value.

MINES.	States.	For the week.	Month of February.	Year from Jan. 1st, 1882.
Alta-Montana, G.	Mont.	.....	$22,000	$34,200
Barbee & Walker, S.	Utah	2,782	5,967	18,439
Bodie, G.	Cal.	8,880	17,030	47,910
Caledonia, G.	Dak.	.....	.....	22,553
*†Chrysolite, S.	Colo.	.....	.....	41,805
*Contention, G. S.	Ariz.	.....	.....	121,886
Crismon-Mammoth, G.	Utah	2,100	2,100	3,880
*Custer, G. S.	Idaho	16,347	16,347	44,168
*Deadwood-Terra, G.	Dak.	.....	.....	61,880
Eureka Con., G. S. L.	Nev.	15,000	35,700	98,200
*Grand Central	Ariz.	.....	.....	100,000
*Head Center, S.	"	.....	.....	14,860
*Homestake, G.	Dak.	.....	.....	107,491
Horn-Silver, S. L.	Utah	70,500	118,000	502,350
Inyo Cons., G.	Cal.	20,000	37,000	77,000
Leeds, S.	Utah	.....	.....	4,950
Manhattan, S.	Nev.	.....	.....	64,300
Mount Diablo, S.	"	.....	17,300	17,300
Noonday, G.	Cal.	5,760	5,760	18,610
Northern Belle, S.	Nev.	16,000	33,390	84,860
North Noonday, G.	"	.....	6,200	17,200
*Ontario, S. L.	Utah	.....	80,862	‡304,567
Ophir, G. S.	Nev.	.....	12,000	12,000
Pascoe, S.	Utah	.....	.....	4,575
Silver King, S.	Ariz.	.....	.....	41,000
Standard, G.	Cal.	19,430	34,270	179,570
Star, G.	Nev.	1,200	3,200	12,100
Stormont, S.	Utah	10,708	18,703	32,659
Syndicate, G.	Cal.	.....	.....	8,000
Tintic M. and M. Co.	"	3,681	7,003	9,928
*Tombstone, G. S.	Ariz.	.....	.....	150,478
Vizina, S.	"	.....	.....	31,000
Total amount of shipments				$2,289,719

*Official. †Net. *G. Gold. S. Silver. L. Lead.* ‡Assay value.

Bullion Receipts at New York.—The bullion received from the mines at the various offices in this city during the week ended February 24th, as compiled from various sources, amounted to $245,000, as against $329,000 reported for the previous week. The receipts from January 1st, 1882, to date are $2,444,353.13.

Exports of Gold and Silver from New York.

Week ended February 11th	$1,328,158.00
Corresponding week last year	161,670.00
Since January 1st, 1882	7,083,178.00
Corresponding period last year	1,157,263.00

Foreign Bank Statements.—The governors of the Bank of England, at their weekly meeting, reduced the minimum rate for discount 1 per cent to 5 per cent. During the week, the bank gained £463,000 bullion, and the proportion of its reserve was raised from 37⅝ to 38 9-16 per cent, against 49¾ per cent at the same date last year. February 23d, the Bank made a further gain of £160,000 bullion on balance. The weekly statement of the Bank of France shows a gain in specie of 9,600,000 francs gold and 4,300,000 silver. Both the Bank of France and the Bank of Belgium reduced their rates for discount to 4½ per cent.

METALS.

NEW YORK, Friday Evening, Feb. 24.

The metal market has been a quiet one, and has been a little affected by the demoralization in the share market.

Copper.—The business has been quiet, the sales amounting to but about 500,000 pounds at 19@19¼c. cash. At the close, 19c. was bid and 19¼c. asked. The mining companies ask 20c. It is said that a number of speculative settlements have been made since our last. Chili Bars in London are quoted at £65.

According to the daily mail advices from Messrs. James & Shakspeare, the course of the copper market in London was as follows: On the 6th inst., there was a firm tone and a fair business, good ordinary brands selling at £66⅛ sharp cash. A slight break occurred, however, on the 7th, the market rallying toward the close, the lowest quotations being £65¼. A further decline took place on the following day, sharp cash being £64¾, followed by sales on the following day with a further decline to £63½@£63¾ for sharp cash, the rapid decline inducing a considerable business.

On the 10th inst., Messrs. James & Shakespeare reported as follows:

A better feeling prevailed, and there was a good inquiry for Chili Bars at yesterday's prices. A small business took place this morning at £63¾@£64⅛ for sundry fixed prompts, and at £64¼ usual fourteen days; but in most instances, the sales were without allowance of brokerage. In the afternoon, £64⅛ paid net sharp cash, and further takers thereat, sellers asking £64¼, or £64¾ ordinary conditions. For deliveries three months hence up to £65¼. Net has been offered, but nothing to be had below £66¾, customary terms. Wallaroo Cake is quoted £69½@£70½; Burra, £69@£70; English Tough is nominally £68@£72; Select Ingot, £70@£73; India Sheets, £77@£73; Yellow Metal Sheets, 6¼@3/16 l. ℔ ℔.

Tin.—The sales amount to 700 tons at 25@25¼c. on spot and 25⅛@25⅝c. future. The Billiton sale will take place on the 28th, the result of which this market and London are anxiously awaiting. Straits in London is down to £111. Banca in Holland is quoted at 68 florins. Singapore quotes at $34½ and Penang at $34, with exchange at 3s. 10¼d.

From the daily reports of Messrs. James & Shakspeare, we glean the following: Under an active demand, tin advanced on the 6th inst., transactions as high as 114¼s. being reported for early cash. On the 7th, the market became more quiet, prices closing a shade lower. This tendency developed greater strength on the 8th, and still more on the 9th, when limited quantities changed hands down to 110⅜s. sharp cash.

On the 10th inst., Messrs. James & Shakespeare reported as follows:

Tin also recovered a portion of the recent decline, and sales made this afternoon up to 112½s. sharp cash, 113s. one month, 114s. three months. The demand, however, was not particularly active, metal for immediate delivery being offered at 112s. at close of second 'Change.

Tin Plates.—There has been nothing doing in a large way. There is a fair jobbing demand. We quote for large lines: Charcoal tin, Melyn grade, rates for ⅛ cross assortments, $6.50; Allaway grade, rates for ⅛ cross assortments, $6⅛. Charcoal terne, Dean grade, 14 × 20, $5½; 20 × 28, $11½; Allaway grade, IC, 14 × 20, $5.30; Coke tin, Yspitty grade, IC, $5.62½@$5.75; B. V. grade, IC, $5.30@$5.35. Coke terne, Glais grade, IC, 14 × 20, $5.25.

Lead.—There has been but a retail business at 5·20c.

The shipments of lead over the St. Louis & San Francisco Railroad for the week ended February 14th amounted to 264 tons.

Spelter.—This article is very quiet at 5⅛c.

Sheet-Zinc.—Without much activity, we quote this at 7½c.

Antimony.—There has been considerable activity in this article. We quote Cookson's at 14¾c. bid and 14⅞c. asked; Hallett's at 13c. paid and 13⅛c. asked.

COAL STOCKS.

NAME OF COMPANY.	Capital Stock.	SHARES. No.	SHARES. Par Val.	Last Dividend. Mo.	Last Dividend. Y.	Last Dividend. R't.	Rate per Ann.	Quotations of New York stocks are based on the equivalent of $100. Philadelphia prices are quoted so much per share. Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22. H.	Feb. 22. L.	Feb. 23. H.	Feb. 23. L.	Feb. 24. H.	Feb. 24. L.	Sales from Feb. 18th to Feb. 23d inclusive.
	$		$				Per c'nt													
Am. Coal Co.	1,500,000	60,000	25	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Cameron C'l.	2,500,000	50,000	50	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Col. C. & I.	10,000,000	100,000	10	....	..	....	....	45	41⅛	42	41½	41¼	40⅝	....	....	43	38¾	....	....	5,017
Ches. & O. RR	15,000,000	150,000	100	....	..	....	....	23½	23⅜	....	....	23⅜	22⅝	....	....	22	20	....	....	1,950
Consol. Coal.	10,250,000	102,500	100	Jan.	82	2	....	....	....	....	....	31	....	....	....	30¾	30	....	....	900
Cumb. C. & I.	500,000	5,000	100	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Del. & H. C.	20,000,000	200,000	100	Sept	81	1½	6	+	108	109¼	108½	108⅜	107¾	....	....	108¼	107½	....	....	7,560
D., L. & W. RR	26,000,000	524,000	50	Dec.	81	2	8	‡	124⅜	125⅛	124¼	124¼	123¾	....	....	124½	121½	....	....	95,942
Lehigh C. & N	10,448,550	208,971	50	Nov.	81	3	5¾	43½	43⅜	43⅞	43¼	43¼	43	....	....	43	42⅜	....	....	4,730
Leh. V'y R. R	27,042,900	540,858	50	Dec.	81	1½	6	62¾	....	....	....	....	....	....	....	62⅛	62	....	....	314
Mary'd Coal	4,400,000	44,000	100	....	76	1½	1½	..	....	....	....	....	....	....	....	....	....	....	....	....
Montauk C'l.	2,500,000	25,000	100	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Morris & Es'x	15,000,000	300,000	50	Jan.	82	....	7	....	....	122½	122	122⅛	....	....	....	....	....	....	....	285
New Cen. C'l	5,000,000	50,000	100	Dec.	81	....	....	....	....	17	....	17	....	....	....	....	....	....	....	400
N. J. C. RR.	20,000,000	200,000	100	Oct.	76	2½	2¾	95⅞	92¼	97½	94⅛	95⅛	93	....	....	94½	91	....	....	47,920
Penn. Coal	5,000,000	100,000	50	....	..	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Penn. R. R.	98,870,200	1,337,404	50	Nov.	81	4	....	61¼	60⅝	61¼	60¾	60¾	6 0⅝	....	....	60¾	59⅝	....	....	16,805
Ph. & R. RR	34,278,150	685,563	50	Jan.	76	2¼	10	64¼	61	61	58½	58⅜	57¼	....	....	58	55⅝	....	....	81,981
Spring Mt. C'l	1,500,000	30,000	50	Dec.	81	3½	7	....	....	....	....	....	....	....	....	....	....	....	....	....

†109¼. ‡125¾. Total sales..... 263,074.

PHILADELPHIA MINING STOCKS.

	Feb. 16. H.	Feb. 16. L.	Feb. 17. H.	Feb. 17. L.	Feb. 18. H.	Feb. 18. L.	Feb. 20. H.	Feb. 20. L.	Feb. 21. H.	Feb. 21. L.	Feb. 22. H.	Feb. 22. L.	Sales.
Algonquin	.....	.....	.....	.....	.....	.....	.20	.....	.20	.....	.....	.....	1,000
Am. Con	.....	.....	.04	.03	.04	.....	.....	.....	.04	.03	.....	.....	25,500
Argent	.....	.....	.32½	.....	.32½	.....	.32½	.....	.35	.32½	.....	.....	5,400
Atlanta	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aztec	.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Battle Mt.	.....	.....	.....	.....	.04	.....	.....	.....	.....	.....	.....	.....	2,000
Black Sulphuret	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Buena	.19	.18	.17	.....	.18	.17	.17	.....	.....	.....	.....	.....	7,400
Bunker Hill	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cincinnati	.32½	.30	.30	.....	.30	.27½	.....	.....	.30	.27½	.....	.....	6.700
Compromise	.50	.47½	.50	.45	.50	.47½	.50	.45	.50	.45	.....	.....	24.000
Con. Virginia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Crown	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dauntless	.05	.....	.....	.....	.....	.....	.04	.....	.....	.....	.....	.....	3,300
Del Monte	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Den. City Con	.50	.....	.47½	.....	.50	.45	.45	.....	.45	.35	.....	.....	3,450
Eureka Con	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,000
Fairview Con	.03	.....	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	8,000
Flora Morrison	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Girard	1.90	1.82½	1.95	1.85	1.95	1.90	1.95	1.92½	1.97½	1.87½	.....	.....	11,750
Golconda	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Golden Age Group	.....	.....	.06	.05	.06	.....	.....	.....	.....	.....	.....	.....	14.000
Gov. Group	.....	.....	.....	.....	.45	.40	.45	.40	.42½	.40	.....	.....	6,800
Grand Trunk	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand Union	.08	.07	.08	.07	.09	.07	.....	.....	.08	.....	.....	.....	8,000
Gun. Imp. Co	.....	.....	1.70	.....	1.70	.....	.....	.....	.....	.....	.....	.....	400
Hancock	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hibernia Con	.....	.....	.....	.....	.....	.....	.15	.....	.....	.....	.....	.....	200
Homestake	.....	.....	.04	.....	.....	.....	.03	.....	.....	.....	.....	.....	1,500
Iowa Gulch	.25	.....	.....	.....	.25	.....	.25	.24	.25	.24	.....	.....	5,675
King Bullion	.04	.03	.....	.....	.....	.....	.04	.....	.....	.....	.....	.....	9,000
Little Diamond	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Maud	.10	.09	.....	.....	.....	.....	.10	.....	.....	.....	.....	.....	2,800
Long & Derry	.....	.....	.....	.....	.....	.....	.05	.....	.05	.04	.....	.....	9,200
Magnolia	.08	.05	.10	.07	.13	.09	.11	.10	.12	.11	.....	.....	47,500
McCullough	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Monitor	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montana	.....	.....	.20	.17	.20	.....	.....	.....	.20	.....	.....	.....	535
Mt. Lincoln	.....	.....	.....	.....	.....	.....	.....	.....	.05	.04	.....	.....	1,500
Mt. Sheridan	.....	.....	.....	.....	.08	.....	.....	.....	.....	.....	.....	.....	500
National	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Orion	.35	.....	.35	.....	.32½	.....	.50	.27½	.....	.....	.....	.....	3,160
Palmetto Ex.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panther	.30	.....	.....	.....	.30	.....	.....	.....	.30	.....	.....	.....	600
Pembina	.80	.70	.65	.62½	.....	.....	.....	.....	.67½	.65	.....	.....	2,100
Penn Breck	.27½	.....	.....	.....	.25	.24	.....	.....	.27½	.25	.....	.....	5,000
Permanent	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pizarro	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pizarro Exten.	.06	.05	.06	.....	.07	.06	.....	.....	.07	.....	.....	.....	13,375
Rara Avis	.....	.....	1.70	1.60	.....	.....	1.67½	1.55	.....	.....	.....	.....	800
Rara Avis Ex.	.11	.....	.11	.....	.11	.....	.11	.....	.12	.....	.....	.....	9,100
Rico Pioneer	.....	.....	.15	.11	.....	.....	.....	.....	.....	.....	.....	.....	2,000
San Pedro	.....	.....	.15	.13	.14	.13	.14	.13	.13	.....	.....	.....	47,500
Silver Cord	.85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	400
Silver Plume	.06	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500
Silver Rock	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,000
Sovereign	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard	.04	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6,300
Sultana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tombstone	4.55	4.45	4.52½	4.45	4.52½	.....	4.52½	4.50	.....	.....	.....	.....	4,550
Tyrone	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Victor	.....	.....	.....	.....	.....	.05	.03	.05	.04	.05	.....	.....	52,600

BOSTON MINING STOCKS.

	Feb. 16.		Feb. 17.		Feb. 18.		Feb. 20.		Feb. 21.		Feb. 22.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adrie Cons	1.15				1.14								200
Allouez	3.00												7
Ariz. Queen	.45	.40											400
Arnold													
Atlantic	14.00						13.50						75
Beacon Hill	1.13	1.10											200
Blue Hill					.40								100
Bonanza Devel					4 13-16				4.50				125
Boston & Eureka													
Boulder Con													
Brunswick Ant'y	14.00								14.00				210
California													
Cal. & Hecla			231 00	250.50	231.00		231.25		233.00	232 00			52
Carbonate Hill													
Carolina Queen									2.50				50
Catalpa	.55				.52½				.55				425
Cedar Springs													
Central													
Central Arizona													
Columbus Gold													
Cons. Virginia													
Copper Falls													
Copper Harbor													
Copperopolis													
Crescent					.41								100
Cumberland	.68				.70	.68			.70				1,000
"Cusi"													
Dana													
Deer Isle	21	20			.18				.19	.17			4,100
Doug lass	.50												300
Duncan													
Dunkin													
Edgemoggin													
Empire					.50				.50	.46			1,800
Franklin	10.50		11.00	10⅞			11⅜	11.25	11.25				675
Gem													
Globe, pref													
Goulsboro'													
Granger	.07												1,000
Hanover													
Harshaw													
Hopewell Mang					2⅜		3.25	3 1-16	3.00				400
Humboldt													
Huron	2 1-16		2⅛				2⅛		2.25				400
Indian Queen													
Mammoth Copper	.10	.08							.10	.08			6,100
Mascot													
Mass. & N. Mex	.22				.23								1,200
Menlocino													
Mesnard													
Milton	.10	.09			.12	.11			.14	.10			7,900
Minnesota													
Napa					6.75		6.50						350
National			2.00		2⅛								800
No. Castine													
Osceola					31.00	30.75			31.00	30.00			128
Peabody													
Pewabic	13.00				13.50	13.25			12.25				400
Phœnix			3⅜	3.25	3.50	3.25	3.50		3 50				845
Pine Tree													
Plymouth Gold													
Port & Sullivan													
Quincy	41.25	40.50	42.75	40.75	43½	42.75	43.00		43.00	42.50			634
Ridge					.75		.50						165
Rose Silver	.50				.50								400
San Pedro	.53		.55										300
Silver Hill													
Silver Islet	20.00						20.00	19.00	18.50	18.00			120
Silver Lake													
Simpson Gold													
Southern Belle													
South Site													
Star Copper													
Sultan Mtn. Silver	.50	.45											200
Sullivan	1.75						1⅞		2.00	1.75			400
Sycamore													
Titus Cons													
Tremont Silver													
Twin Lead					.16	.13			.21	.13			13,000
Vizina													
War Eagle	.64	.60			.70	.66			.74				3,150
Winthrop													
Young Hecla													

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 24.

There has been but very little done during the past week. Nevertheless, there is a very large consumption, and prices, as a rule, are well maintained. The only weak section of the iron trade is in rails, which naturally suffer during a depression like the one which has visited Wall street. It becomes a serious question as to whether many of the railroad companies will be able to raise the money to pay for the iron they have ordered, and whether others will be able to order what they had proposed. The feeling generally is, that the present condition of affairs could not have come at a better time, and most are confident of a very satisfactory business within a few months. In the mean time, the orders booked will fairly maintain prices.

American Pig.—We note a sale of 1000 tons of North River Forge on private terms. There have been other fair transactions, the particulars of which we were unable to obtain. The consumption of this iron is said to be in nearly all cases greater than last year, with every prospect that it will keep up. Although the market is very quiet, prices are quite steady. We quote No 1 Foundry at $26@27; No. 2 Foundry, $25; and Forge, $22@23½, the lower quotation for inferior.

Scotch Pig.—There is less disposition to anticipate wants, and as a consequence the demand is quiet. Present arrivals are all going into consumption on contracts made early in January, and this condition of affairs is likely to continue several weeks longer. Cable advices of yesterday say:

The committee appointed in accordance with a resolution at a meeting of the iron trade a week ago, to consider the desirability of forming an iron exchange in this city, and to frame a constitution and by-laws for this, is not approved by the iron brokers. They assert that their interest is not represented, and that the members of the committee are not enthusiastic enough in regard to the proposition. The brokers threaten to form an organization independently of the manufacturers and importers.

Freights are still quoted at $20@$25. We quote Coltness at $27@$27½; Gartsherrie, $26@$26½; Glengarnock, $25@$25½; and Eglinton, $24@$24¼. We note sales of 500 tons of various brands.

Messrs. John E. Swan & Brothers, of Glasgow, under date of February 10th, report 106 furnaces in blast, as against 122 at the same time in 1881. The quantity of iron in Connal & Co.'s stores was 631,155 tons, an increase of 75 tons for the week. The shipments show a decrease of 3082 tons, as compared with the shipments to the same date in 1881. The imports of Middlesbrough pig-iron for the same period show an increase of 11,524 tons. The following were the quotations of the leading brands of No. 1 pig-iron: Gartsherrie, 59s.; Coltness, 59s. 6d.; Langloan, 60s.; Summerlee, 59s.; Carnbroe, 54s. 6d.; Glengarnock, 54s.; Eglinton, 50s. Middlesbrough pig-iron was quoted as follows, f. o. b.: No. 1 Foundry, 45s. 6d.; No. 2, 44s.; No. 3, 42s.; No. 4, 41s. 6d.; No. 4 Forge, 41s.

Rails.—There is nothing doing in these. In the absence of business, we can only refer to our last.

Old Rails.—Without business, we quote Ts at $30, and D. Hs., $31½@$32.

Wrought Scrap is very quiet, and quoted at $31½@$32 from ship.

We publish the following letters from our regular correspondents:

Cincinnati. Feb. 22.

[Specially reported by JACOB TRABER & Co.]

The demand for pig-iron continues favorable to the sustaining of present prices, and we do not change our quotations of last week.

	Four months.
No. 1 Hanging Rock Charcoal	$29.5. @$30.00
" 2 " " "	28.50@ 29.00
" 1 Tenn. Charcoal	28.50@ 29.00
" 2 " "	27.50 @ 28.00
" 1 Hanging Rock and Virginia Coke	28.50@ 29 00
" 2 " " "	27 50 @ 28.00
Jackson G. and C. Range	24.50@ 28.00
Hanging Rock C. B. C. Wheel, all Nos	39.00 @ 40.00
Virginia " "	38.00@ 39.00
Southern " " "	27.00@ 38.00

Louisville. Feb. 21.

[Specially reported by GEORGE H HULL & Co.]

The market for pig-iron is quiet. Stocks are very light, and furnaces are not only behind in deliveries on their contracts, but are having difficulty in getting iron to consumers as fast as it is required for immediate use. Mill irons, which were held for future delivery at $25 two weeks since, could probably be bought at $24@$24.50 to-day. There is, however, no iron pressing on the market, and as furnaces are sold several months ahead, it is altogether likely that the market will react before there is any pressure to sell. We revise quotations as below:

FOUNDRY IRONS.

	No. 1.	No. 2.
Hanging Rock Charcoal	$30.00@$31.00	.....@ .....
Southern Charcoal	28.00@ 29.00	.....@ .....
Hang Rock, Stc'l & Coke	27.50@ 28.00	.....@ .....
Southern Stonecoal & Coke	27.00@ 27.50	$25.50@$26.00
Amer. Scotch	$25½@$26	Op'n Silv'r Gray...$25@$26
Clse Silver Gray	23 @ 24	

MILL IRONS.

No. 1 Charcoal	$25.00@$26.00
No. 1 Stonecoal and Coke, neutral	24.00@ 24.50
No. 2 Stonecoal and Coke, neutral	23.00@ 24.00
No. 1 Stonecoal and Coke, cold-short	23 00@ 23.50
No 2 Stonecoal and Coke cold-short	22.50@ 23.00
White & Mottled, cold-short and neutral	21.00@ 22.00

CAR-WHEEL AND MALLEABLE IRONS.

Hanging Rock, cold blast	$36.00@$38.00
Hanging Rock, warm blast	30.00@ 32.00
Central Kentucky, cold blast	34.00@ 37.00
Alabama and Georgia, warm and cold blast	34.00@ 36.00

Pittsburg. Feb. 20.

[Specially reported by A. H. CHILDS.]

Market has been very quiet during the past week, and transactions few and light. Buyers are holding off in hopes of lower prices, while furnace men are generally sold well ahead, and profess confidence that present prices will be fully sustained. Quotations are unchanged.

4 mos.		4 mos.	
No. 1 Foundry	$27 @$28	Mottled & Wh.	$32 @$34
" 2 "	26 @ 27	Warm Bl Ch.	32 @ 35
Gray Forge	25 @ 26½	Cold " "	35 @ 41

St. Louis. Feb. 18.

[Specially reported by HOFFER, PLUMB & Co.]

There is no change to note in this market, the tone of which is still dull. car-wheel irons being particularly so. Prices nominal.

Philadelphia. Feb. 24.

Quotations have maintained a uniformity throughout the past six days. The market is quiet, and demand is declining. The spring season is near at hand, and manufacturers anticipate a revival of activity. The lull is due partly to the season, partly to the anticipation of wants, and partly to a belief that foreign iron is about coming. There is no decline in prices, and no perceptible tendency that way. There is no iron to offer. Furnaces making fine grades have sold ahead indefinitely. Lehigh irons are quoted at $22@$23 at furnace, but very little sells at either extreme. The facts that there are no surplus stocks, a strong demand, no imports, high freights, little chance for imports, and a strong probability of increasing consumption lead makers to regard the situation serenely. Foundry No. 1 is quiet at $26@$27; No. 2, $24.50. White and Mottled is becoming scarce. English is dull at $21.50. Bessemer is in negotiation; a few small lots sold at $26.25; $26.50 is asked, and $26 was offered for shipment. Merchant iron is steady and firm. Mills are meeting current requirements at 2⅝c.; store at 3c.; card is reaffirmed at 2⅞c. Buyers are ordering smaller quantities. More uncertainty prevails as to the course of prices, and neither makers nor buyers seem disposed to risk any thing. Nails are quiet at

$2.40. Skelp sold at 2⅞c. Muck bars, 600 tons in all, at $46@$46.50. Sheet-iron orders are seeking acceptance at 4½@5½c., 16 to 28. Wrought-pipe mills are full of orders at 55 off. Structural iron is weaker, not from any weakening in demand, but out of a precautionary motive to keep business at home. Angles are 3@3¼c.; Beams, 3¾@4c., and Channels and Tees, 4@4½c. Plate and Tank quiet and firm. Steel rails were inquired for to the extent of 15,000 tons, and negotiations will close this week at about $57. Old rails are dull at $30; Doubles, $32. Small lots only were sold. Demand has fallen off, and a declining tendency will assert itself in a few days.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 24.

Anthracite.

The situation in this trade is steadily getting worse. Prices have not declined much since our last; but they certainly are lower in some instances, and not higher in any. We do not believe that there is much of an accumulation of coal in first hands, but it is probably sufficient to make it necessary for some of the companies to force sales. This condition might have been averted had the managers taken action earlier than they did, or even if they had made their action stronger. The demand to-day is decreased by a general distrust, as well as by mild weather. The distrust among the companies causes them to take whatever business they can, either for immediate or future delivery, at the best prices obtainable. This is a showing of weakness to buyers, and as it becomes known to other producers, as it always does, it causes uneasiness and throws a doubt over the earnestness of the declared intentions of the companies, thereby causing general demoralization. There is one advantage in all this, and that is, that it probably makes the situation appear actually worse than it is or should be, and in time the managers will be led into taking such action as may put the trade on a good foundation.

The production of coal for the first seven weeks of this year aggregated 2,842,558 tons, or at the rate of 405,079 tons per week, or 21,116,108 tons per annum. This is but little less than for the same period of 1881; but then last winter was an exceptionally good one for coal consumption.

This is always a poor month in the coal trade, and it is not safe to base calculations of a poor year upon the business now doing. The iron trade and manufacturing business promise fully as well for this year as in 1881, while it is a well-known fact that the demand for domestic sizes of coal increases steadily with the increase of population, and is enlarging in the West, for instance, at even a greater ratio. We still believe that there will be shipments of coal equal to 30,000,000 tons this year. If dealers and consumers keep out of the market as long this year as they did last, there will be even greater difficulty in meeting the demand. The mines have a capacity greater than any demand that is likely to come. It will be found, however, that, if too much coal is called for during the last few months of the year, the transportation facilities will be inadequate. Such was the case in 1881, and we see no chance of an enlargement of facilities this year. Vessel rates are low now for this season of the year. This is not owing to an abundance of vessels, but to the very small demand for shipment.

No arrangement has yet been made to curtail production during March. It is thought, however, that something will be done very quickly.

The retailers have had a much better business during several days past, owing to colder weather. This will probably result in the replenishing of depleted stocks soon, provided a change of temperature does not occur too quickly.

The production of anthracite coal last week was 402,920 tons, as compared with 338,466 tons the previous week, and 524,826 tons the corresponding week of 1881. The total production from January 1st to February 18th was 2,842,558 tons, as against 3,014,453 tons for the like period of last year, showing a decrease this year of 171,895 tons.

Our regular correspondent at Philadelphia, under date of February 23d, says:

The city and line trade continues in a very fair condition, and the prices well maintained. Lump, steamboat, broken, and chestnut are short. The late rains, stopping several collieries, make the demand for these sizes quite active. Small stove is in great demand also. A few orders for shipment East have been received because of the favorable freights, which have settled to $1.75 to Boston, with concessions on that rate for large vessels. No programme has yet been determined upon for March. Some curtailment will be necessary to get off the excess of some sizes in New York, which continue to depress the market.

Mr. John H. Jones makes the following statement of the coal tonnage for January.

	January, 1882.	January, 1881.	Difference.
			Increase.
Phila. & Read. RR..	408,367 09	392,158 16	16,208 13
Lehigh Valley RR..	359,216 02	330,756 04	28,459 18
Central RR. of N. J.	264,291 15	236,814 01	27,477 14
Del. L. & W. RR...	291,514 02	269,326 17	22,187 05
Del. & H. Canal Co..	222,400 17	187,073 08	35,327 09
Penna. RR.....	165,992 01	155,742 00	10,250 01
Penna. Coal Co....	96,185 16	70,835 04	25,350 12
N.Y., L.E. & W. RR.	25,942 14	29,938 14	*3,996 00
Total.....	1,833,910 16	1,672,645 04	161,265 12

* Decrease.

The stock of coal on hand at tide-water shipping points, January 31st, 1882, was 586,933 tons; on December 31st, 1881, 497,024 tons; increase, 89,909 tons.

Bituminous.

There is a little better supply of cars, but it is still much below the requirements of the trade, and, as a consequence, the supplies are very small and prices well sustained. We quote at $5. The chances are in favor of higher prices. On the 16th inst., there was a meeting of the producers of Cumberland coal at Baltimore for the purpose of considering the interests of that field. The proceedings have been kept secret, but it is believed that a movement is on foot to reduce wages, which are much too high. It is thought that, if such a demand be made a lock-out will be the result, in which case the supply of bituminous coal will become exceedingly scarce.

Pittsburg. Feb. 20.

[From our Special Correspondent.]

The following are correct quotations:

COAL.—(River) lump, by the barge (12,000 bushels), at city landings, 5@6½c.; nut, in similar quantities, 3@4½c.; slack do., 2@3c. (Railroad coal) wholesale, car-load lots, "on the wall," that is, at the city yards, lump, 6½@7c. per bushel; retail, delivered, 8@10c. per bushel, equivalent to $2.60 per ton. Anthracite in growing demand at $6.50 per ton, delivered.

COKE.—Steady at prices which have ruled since January 1st, namely, $1.75@$1.80 per ton of 2000 lbs., on board cars at ovens in larger quantities than single car lots. Single cars, $2 per ton.

The condition of the Pittsburg coal trade at present writing is one of uniform dullness, particularly as to the river branch of the industry. The mild weather, the comparatively high rate of mining, and the plethoric condition of the markets that draw their supplies in whole or in part from Pittsburg, are elements which enter into the present state of affairs. The unusually favorable stage of water has enabled the river shipper to add to the stocks already accumulated in Cincinnati, Louisville, Memphis, Nashville, and New Orleans. These causes have led to an unhealthy condition of the river coal trade. Pittsburg coal to day in Cincinnati is quoted at 7@8 cents by the quantity, afloat, which is 1 cent below cost of the article at that point; at Louisville, a similar discrepancy exists; and at New Orleans, the price is 2 cents per barrel below cost at the landings at that city.

In the first four "pools" of the "slackwater" of the Monongahela, where this coal is mined, a number of mines are closed. Others are enabled to run in a lazy sort of way as the empty craft return for reloading. Many shippers are embarrassed by the slowness of dealers below in unloading barges, the result of their unwillingness to "yard" coal. They take the ground that the present state of affairs must soon result in a reduction in the price of mining, hence a further drop in coal. The "hand-to-mouth," or rather barge-to-consumer policy is adopted, and the yards as a general thing are empty and the coal craft full. It is difficult to foretell the end of all this. The railroad dealers may stand this double pressure of four cent mining and slow demand for some time, but the river dealers growl a mightier growl as time passes. Lumber for their boats and repairs has advanced from 25 to 40 per cent; labor also, particularly the skilled labor of the calker and boat-builder; pit timber, "outside" work, every thing, in fact, in the form of labor and material, has steadily advanced, while the price of coal has as steadily declined. Between these two millstones, the Pittsburg coal operators are having a right pleasant time, and if some of them are to be believed, the days of four-cent mining are numbered.

Meanwhile, with the exception of a few hours of wintry weather semi-occasionally, the days are almost spring-like, and domestic consumption is at low ebb.

Boston. Feb. 18.

[By our Special Correspondent.]

Trade has been quiet with jobbers during the week, though a little more inquiry is noticeable at the close for anthracite coals, arising from the prospects of another cold snap. Orders received from this cause have been mainly from retailers, and afford another demonstration of the fact that stocks in their hands are not up to the usual winter average.

Manufacturers are ordering anthracite only in a small way, but there is some little activity in bituminous coals. The present inquiry is small, but, owing to the want of cars for transportation at the mines, the receipts of bituminous at this port have been insufficient to fill contracts, and so the business drags along into the dull season. Of the coal now coming forward, an unusually large amount is bituminous for this season, amounting to 12,617 tons this week, which, as will be seen by the reference to the table, is larger than the amount of anthracite shipped from New York. The shipments of anthracite from Philadelphia have, for some weeks past, been received mainly in the regular steamers of the Philadelphia & Reading Company, and do not represent the actual demands of the trade which are expressed in the New York shipments.

This is owing wholly to the manner in which freight rates favor the latter city, for in this respect the week has brought no change. Freights have been a little weaker, but maintain their relative standing, and are quotably no lower, and we look for no decline of note until next month. This opinion is generally held by the trade.

A thousand-ton vessel at this port has been offered this week at $1.75 from Philadelphia; but as it would be between two and three weeks before the cargo would be delivered here, the offer was declined by several parties, and we do not learn that it has yet been accepted; for although that price is now from 25 @35c. below the current rate, dealers were not willing to risk the probability of a still further decline in that time. We quote freights as follows:

New York, $1.40@$1.50; Philadelphia, $2@2.10; Baltimore, $2; Cape Breton, $2.75. The receipts for the past week and since January 1st, 1882, are shown by the following table:

	For the week.		For the year.	
	1882.	1881.	1882.	1881.
Anthracite.....	19,611	2,410	104,099	38,413
Bituminous.....	12,617	983	38,844	13,265
Nova Scotia and Great Britain.....	....	....	807	2,127
Total	32,228	3,393	143,750	53,805

Prices have undergone no quotable change during the week, but are, if any thing, a trifle firmer, with less shading of circular rates. We quote jobbers' prices, delivered, per ton 2240 lbs.:

Furnace lump..	$5.55@$5.65	Westmoreland .	$5.75@$5.85
Broken.....	5.35@ 5.45	Youghiogheny..	....@ 5.75
Egg.....	5.45@ 5.55	Penn	....@ 5.75
Stove.....	5.55@ 5.60	Cannel, Eng..	... @12.00
Chestnut.....	5.55@ 5.60	Cannel, Cannel-ton...	9.50@10 00
Anth. screen...	3.00@ 3 60		
Franklin.....	6.65@ 7.15	Newcastle.....	...@ 4.75
Lehigh lump. .	6.90@ 7.00	Culm	....@ 4.00
Cumberland....	5.50@ 5.75	Caledonia.....	....@ 4.25
Clearfield.....	5.50@ 5.75		

The retail trade is at this midwinter season easily affected by the weather, and on this account was quite dull early in the week. Orders, however, are now coming in more satisfactorily, though for small lots. Prices are well maintained as follows:

Lehigh broken and egg.....	$7.00
Broken and egg.....	6.50
Stove	6.75
Shamokin, egg and stove.....	7.00
Franklin, all sizes.....	8.50
Lorberry, egg and stove.....	7.50

It is said that the Eastern Railroad Company has a short supply of bituminous coal on hand, owing to the difficulty experienced in filling its contracts by companies holding them.

The stocks of Old Company's Lehigh coal are so

short that furnace-men in this vicinity who consume this grade have been obliged to use sizes as small as egg.

There is very little doing in gas coals at present. They are bought by the leading companies mainly on contracts, which will be generally renewed in March, when we may look for more activity in this line.

The total receipts at this port since January 1st exceed those of a corresponding period of 1881 by nearly 90,000 tons, and still stocks are undoubtedly light.

Buffalo. Feb. 21.

[Specially reported by Messrs. LEE & LOOMIS.]

There is a dearth of news, and under the mild weather trade generally is dull. Prices, however, remain the same, with but little cutting. The meeting at Chicago announced that which all knew beforehand—" no change of prices." They endeavored, however, to bolster up the Chicago market, which, under large stocks and slow sales, was fast becoming panicky, and some sort of a coal exchange was formed, which the dealers agreed to uphold by not furnishing coal were the rules violated. Let us hope they will hold out to the end ; but coal exchanges have been formed before this one.

Local prices remain the same, and prices are fairly maintained.

The "Lackawanna" has obtained a grant through Ohio street, upon its own terms. The street is not a wide one, probably not over 35 or 40 feet ; and in it are now, street cars —two tracks, say 14 feet—and to this add double-track steam road, and not much is left for business.

Bituminous coal and coke remain the same, with tendency to firmer prices. In soft coals, an effort was made, the first of the month, to reconcile the differences between the various companies ; but no result of note was accomplished, the meeting ending in smoke.

The Lehigh is at work testing the flats it recently purchased, to see if the rock that proved so costly to the Delaware & Hudson Canal Company is to bother them. This purchase has caused some speculative changes of real estate in that neighborhood, a tract some distance beyond the Tifft Farm having been purchased by a vessel owner and a coal agent here for investment.

Farmers are beginning in this section to tap their maple trees ; and when this is done, we expect that winter is over, and coal sales will be small.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite coal for the week ended Feb. 18th, and years from January 1st :

TONS OF 2240 LBS.	1882.		1881.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co..	46,718	373,360	81,971	426,893
D. L. & W. RR. Co.	63,380	470,048	92,025	504,538
Penn. Coal Co.....	14,036	111,555	22,805	126,732
L. V. RR. Co.....	12,919	125,484	38,932	133,903
P. & N. Y. RR. Co..	3,117	21,159	857	5,069
C. RR. of N. J.....	53,042	253,394	48,077	273,857
	193,272	1,355,000	284,670	1,471,012
Lehigh Region.				
L. V. RR. Co.....	63,617	455,316	86,705	511,020
C. RR. of N. J.....	29,236	215,513	42,815	218,044
S. H. & W. B. RR..	.....	1,223	.....	676
	92,853	672,052	129,520	729,740
Schuylkill Region.				
P. & R. RR. Co	96,384	658,200	101,532	680,383
Shamokin & Lykens Val.....	19,029	151,032	7,879	125,208
	115,413	809,232	109,411	805,591
Sullivan Region.				
SLine&SulRR.Co.	1,382	6,274	1,225	8,110
Total	402,920	2,842,558	524,826	3,014,453
Increase.....	.....	.....	.....	.....
Decrease	121,906	171,895	.....	.....

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

Total same time in 1877.....	2,022,819 tons.
" " " " 1878.....	1,819,392 "
" " " " 1879.....	2,562,750 "
" " " " 1880.....	2,620,529 "

Belvidere-Delaware Railroad Report for the week ended Feb. 18th :

	Week.	Year. 1882.	Year. 1881.
Coal for shipment at Coal Port (Trenton)			
Coal for shipment at South Amboy	11,558	86,819	64,884
Coal for distribution.....	10,881	83,344	116,328
Coal for company's use	3,185	18,158	17,487

The Transportation of Coke over the Pennsylvania Railroad for the week ended Feb. 11th, and year from Jan 1st :

Tons of 2000 lbs.	Week.	Year.
Penn. RR. (Alleghany Region).....	2,040	12,681
West Penn. RR..	2,294	17,483
Southwest Penn. RR 37,894		215,603
Penn. & Westmoreland Region, Pa. RR	6,499	34,968
Pittsburg, Penn. RR 10,933		65,730
Show Shoe (Clearfield Region).....	438	3,480
Total	60,098	349,945

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania railroads amounts to 68,396 tons, as compared with the corresponding period in 1881.

The Production of Bituminous Coal for the week ended Feb. 11th was as follows :

Tons of 2000 lbs., unless otherwise designated.

	Week. Tons.	Year. Tons
Cumberland Region, Md.		
Tons of 2240 lbs	41,064	232,147
Barclay Region, Pa.		
Barclay RR., tons of 2240 lbs	7,410	47,643
Broad Top Region, Pa.		
Huntingdon & Broad Top RR	5,022	26,439
East Broad Top.....	2,469	12,539
Clearfield Region, Pa.		
Snow Shoe.	3,008	16,465
Tyrone and Clearfield..... . . .	39,940	267,592
Alleghany Region, Pa.		
Pennsylvania RR.. 10,023		54,688
Pittsburg Region Pa.		
West Penn RR.....	7,178	39,957
Southwest Penn. RR..	750	3,293
Penn & Westmoreland gas-coal, Pa. RR.....	23,008	156,925
Pennsylvania RR..	13,753	80,869

The shipments of Cumberland Coal, over the George's Creek & Cumberland RR., by the Maryland and the American Coal companies, for the week ended Feb. 18th, amounted to 3721 tons, and for the year from Jan. 1st, 26,768 tons.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actua. charters to Feb. 24th, 1882.

Harbor freights are 15 cents from Hoboken and 18 cents from Amboy.

PORTS.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Johnson, South Amboy, Hoboken, and Weehawken.
Alexandria.....	.....	1.00	... .
Allyn's Point....	1.35@1.40	.....	.....
Annapolis.... ...	.....	.50@.55	.....
Albany.....	.....	.....	.....
Baltimore	.....	.....	.....
Bangor.....	.....	2.50	.....
Bath, Me.....	... .	2.00	1.25*
Beverly...	.....	.....	1.50
Boston, Mass.....	1.65@1.70	1.90@2.00	1.40@1.50
Bristol..... ...	1.35@1.40	1.80	.....
Bridgeport, Conn.	.....	1.70	.50
Brooklyn	.....	1.60	.....
Cambridge, Mass.	....	2.00@3.00	1.40@1.50
Cambridgeport ..	2.00@3.00	2.00	1.40@1.50
Charleston.....	.....	1.00	.....
Charlestown.....	1.70	2.00@3.00	1.50
Chelsea.....	1.70	2.00	1.50
City Point.....	.....	1.00	.....
Com. Pt., Mass..	.....	.....	.....
E. Boston..	1.70@1.80	1.90	1.40@1.50
East Cambridge	....	.....	1.40@1.50
E.Gr'nwich,R. I.	.....	.....	.....
Fall River.....	1.35@1.40	1.75	1.00
Galveston.....	.....	3.75	.....
Georgetown, D.C.	.....	1.00	.....
Gloucester.....	.....	2.25	... .
Hartford.... ...	.....	.....	.....
Hackensack.....	.....	.....	... .
Hudson..... ...	.....	.....	.....
Lynn	2.05@2.00	2.25*	1.55
Marblehead.....	.....	.....	1.55
Medford.....	.....	.....	.....
Millville..... ...	.....	1.75	.....
Milton.....	.....	.....	... .
Newark, N. J.....	.....	1.70	.....
New Bedford	1.40	1.75	.....
Newburyport	.....	2.15	1.70
New Haven.....	1.35@1.40	1.70	.50
New London.....	1.40	1.65	.70
Newbern.....	.....	.....	.....
Newport.....	.....	1.80	1.00
New York.....	.....	1.60	.....
Norfolk, Va ...	.....	1.00	.....
Norwich.....	1.40*	....	.70@.75
Norwalk, Conn ..	.....	.....	.....
Pawtucket.....	1.50*	.....	.....
Philadelphia....	.....	.90	.....
Portland.....	1.65	1.90	1.25*
Portsmouth, Va..	.95	1.00	.....
Portsmouth, N.H.	1.80	2.10	1.55@1.60
Providence.....	1.35@1.40	....	1.00
Quincy Point....	1.80*	.....	1.50
Richmond, Va...	.....	1.25	.....
Rockland.....	.....	.....	1.40@1.50
Rockport	.....	.....	.....
Roxbury.....	.....	.....	.....
Saco.....	.....	2.40	.....
Sag Harbor.....	.....	.....	.....
Salem, Mass.....	1.75	2.05	1.60
Saugus	.....	.....	1.65
Savannah.....	.....	1.10	... .
Somerset.....	1.40	1.75	.....
Staten Island....	.....	.....	.....
Trenton.....	.....	.....	.....
Troy.....	.....	.....	.....
Wareham..... ..	1.80	1.75@2.00	1.15
Washington.....	....	1.00@1.15	... .
Weymouth.....	.....	2.00*	1.60
Williamsbg, N.Y.	.....	.....	.....
Wilmington, Del.	.40	.90	....
Wilmington, N.C.	....	1.25	.....

* And discharging. † And discharging and towing. ‡3c. per bridge extra. § Alongside. ‖ And towing up and down. ** And towing. †† Below bridge.

COPPER KNOB, CROWELL AND NORTH STATE.

INTERVIEW WITH MR. WILLIAM BRANDRETH

Tuesday last, we received a communication which contained some severe strictures on the management of the above companies. A representative of the *Daily Stock Report* immediately interviewed Mr. Brandreth in reference to the main points contained therein as follows :

Question. When was the sale of the Copper Knob and Crowell mines made to the North State Company ?

Answer. The Crowell mine was sold March 14th, 1881, and the Copper Knob was sold March 21st, 1881.

Q. What was the consideration, and how many shares of the capital stock of the Crowell and Copper Knob mining companies voted in favor of the sale, and how many shares were represented at the meeting ?

A. The offer of the North State was as follows : They would give the Crowell Gold Mining Company 41,667 shares of North State stock, and assume the existing debts of the Crowell. They would give the Copper Knob Mining Company 100,000 shares of North State stock, and assume the existing debts of the Copper Knob. At the meeting of the Crowell Company, March 14th, 1881, there were present and voting 403,425 shares out of 500,000, of which 306,425 were present in person and 97,000 present by proxy, of which 378,925 voted in favor of the sale and 24,500 against it. At the meeting of the Copper Knob Company, March 21st, 1881, there were present and voting 835,447 shares out of 1,000,000, of which 793,397 were present in person and 42,050 present by proxy, of which 824,447 shares voted in favor of the sale and 11,000 against it.

Q. What other properties does the North State own ?

A. A mica mine, a quarry of fine soapstone, and a large deposit of very fine kaolin. But what it prizes most is its immense bed of pure magnetic iron ore, which is free from sulphur, phosphorus, and titanic acid, and yields from 35 to 72 per cent metallic iron.

Q. What is the company doing about its railroad rights ?

A. The company projected a line of railway last summer, but could not place its bonds because of the objections made by bankers to any security issued by a mining company. It, therefore, has made contracts with a railroad company that will give through connection to Cincinnati, Ohio, or Charleston, South Carolina, and the North State will receive $2,500,000 in stock of the railroad company, which stock will be divided among the North State shareholders.

Q. What was the object of the assessment just levied ?

A. To provide funds for the erection of a reduction-works at the copper mine, and the prosecution of the general work of the company.

Q. Does the company intend working its iron mines ?

A. It does, and it expects this coming summer to erect one or more furnaces. So soon as thirty-five miles of railway are built, the company will have connection with the seaboard over the Norfolk & Western Railroad. It will then erect rolling-mills, and will have the contract to furnish the rails for the Cincinnati, Virginia & Carolina Railroad Company.

Q. What will be the cost of making iron at the company's iron lands ?

A. I do not know much about iron-working ; but it is stated that charcoal iron can be made for $12.75 per ton.

Q. Can your magnetic iron ore be sold readily without working it ?

A. Yes. All we can ship.

Q. When do you think the company can begin the payment of dividends ?

A. That is hard to tell ; we shall make a dividend of the railroad stock that we are to receive, so soon as we get it, and if the ore holds that we now have at the copper mine, we shall pay dividends soon after the reduction-works are running. After the 35 miles railway are built, we should be able to pay from 5 to 8 per cent a year on our capital from the iron.

Q. You seem to feel confident of the future of the company.

A. Well, I do feel confident; having been over the ground, and knowing what the company has, I have great faith in its future.