THE ENGINEERING AND MINING JOURNAL
AND
COAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XLV. MAY 5. No. 18.

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SUBSCRIPTION PRICE, including postage for the United States, Canada and Mexico, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $5. All payments must be made in advance.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders, or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING COMPANY.

Advertising Rates.—See page XVI.

THE SCIENTIFIC PUBLISHING CO., Publishers.

P.O. Box 1833. 27 Park Place, New York.

CONTENTS.

THE side line apex suit of the Durant *versus* the Aspen has just been compromised, and it is rumored that the fight will shortly be renewed on the Connemara, the next claim beyond the Aspen falling within the limits of the Durant end lines extended.

COMPRESSED oil gas is now attracting a good deal of attention. It is only applicable to certain uses, as in lighting railway cars, buoys, etc.; but it is peculiarly adapted for these purposes. Compression to thirty atmospheres is announced to have been successfully practiced. In mines that do not produce explosive gases, this gas might be used to light the working places, especially where the nature of the roof calls for good illumination.

OUR lively London contemporary, *Money*, having been engaged in a small row with the promoters of the new Welsh gold properties, proposes to settle the controversy by calling in a California miner to decide upon their merits. To this proposition the San Francisco *News Letter*, which, by the way, is equally vivacious, says that "turn about is fair play." After the exhibition made by certain English experts in the West, it would only be the square thing to ship one of our men over as a stand-off. If English companies have to employ Americans for South African, Australian, New Zealand, and South American mines, why not in Wales? To complete the exchange, the Welsh mines should be floated in New York—at ten or one hundred times their value.

A REPORT has been circulated in some of the Western papers to the effect that a change has been made in the ruling by which the lead in silver-lead ores has come in free of duty from Mexico, but we are informed by the Treasury Department that "no change has recently been made in the existing practice of classifying silver-lead ores imported into the United States from Mexico. Questions, however, have been submitted to the Department by parties interested as well in the importation of such ores from foreign countries, as those interested in the domestic mining of such ores, but no definite action has as yet been taken by the Department thereon."

The very important question of the reduction in the tariff on lead from 2 cents per pound as it now is to 1½ cents as proposed in the Mills bill, has not yet come up for discussion. Nor as far as we can learn is there any probability of its being adopted.

MINING TRUST SCHEMES.

Is it becoming necessary for capital to combine, not against labor, but to compete successfully with other capital? Are small investors to be crowded out unless their interests are bound up in corporate organizations, and are the latter, unless unusually strong, to be mere satellites of the numerous pools, syndicates, trusts, etc., which have had such an influence on commerce, finance and manufactures during the past few years? The tendency seems to be entirely in this direction, and on some accounts and to a very limited extent the policy is not a bad one. For example we have trust companies which are as safe as laws and charters can make them, which pay a small regular interest on deposits and make their profit by loaning on mortgage or other security at higher rates, acting simply as agents when conservatively managed. Such institutions are a convenience in handling estates, bequests, annuities and for small capitalists who, for the sake of greater security and the avoidance of worry about the choice of investments are willing to accept reduced returns. The trust companies have also the advantage of being managed by expert financiers, whose judgment and opportunities are of course better than is usually the case with the smaller individual operators. Now a by no means new idea is being revived abroad in the shape of trust investment companies to deal mainly in mines and mining stocks. It is argued that subscribers will gain by the division of chances secured by spreading investments over a large number of ventures, and that what the companies lose in one direction will be made good by profits in others. The scheme is to advance money to float mining enterprises and to operate in the regular share markets. It is doubtful, however, whether it will work. Most similar trusts when applied to the mining industry have had a shady history, and no matter how respectable or at least well-known the names of the managers may be, sad experience will render investors cautious in committing their money to the hands of mining trust investment concerns.

THE HYDROCARBONS OF CALIFORNIA.

The last report of the State Mineralogist, Mr. WILLIAM IRELAN, Jr., and the paper by Mr. W. A. GOODYEAR, show to what an extent the petroleum industry of California is likely to develop. The number of known occurrences is being constantly added to, and without further prospecting it is evident that California possesses important supplies of oil, which in time will be drawn upon. As is well known the California oil is mainly of the heavy variety, there being comparatively little suitable for refining into illuminating oil. Its use as a fuel has passed the purely experimental stage, though new applications and improved methods of burning it will continue to be found. For many years it has been used for generating steam and for metallurgical purposes, but not to a very large extent until lately. Now there is reason to believe that its use as a fuel may assume greater importance, in view of the sulphurous character of the California coal and the high cost of imported coals. The successful results which have followed the introduction of petroleum as a fuel in Russia have been repeated in California on a smaller scale, but enough has already been accomplished to give great promise for the future.

The boom in natural gas has also reached California, and in passing it is curious to note in how many unexpected localities gas is discovered now that its value has become generally appreciated.

Another hydrocarbon, asphaltum, is known to exist in large quantities in the State, and it has been worked to the amount of a few thousand tons annually for a number of years. At present, the local market is limited, and, of course, the product will not bear the expensive handling involved in shipping to points of large consumption; but here, too, is a reserve factor of wealth, which will make itself felt in the future development of the State.

THE SMALLER MINING SCHOOLS.

The Michigan Mining School at Houghton will soon complete its second year, and promises to be a permanent institution. Little is known except locally, of this school or of the mining schools at Golden, Colorado, and Rolla, Missouri, the similar institution at Rapid City, Dakota, and some others, but they all appear to be doing good work. They have a peculiar function, and the closer they adhere to the training for practical work the better the results will be. There are always openings for skilled draughtsmen, surveyors, and assayers, and in the smaller precious metal mines there is a demand for general utility men—that is, men who, without being eminent experts in any specialty, can turn a hand to any one of the many branches of mining and metallurgy. This sort of knowledge can not be picked up by undirected study and observation. The foundation must be acquired by systematic training. The expenses of two or three years spent at a technical school ought to be made up by the earnings of the first two or three years of actual work, with the prospect of a steady advance afterwards. Practical mining men who have worked their way up from the drill and pick to superintendencies appreciate this more than others. Having learned by experience how slowly unaided study progresses, and how much "lost motion" is involved in working over anew old problems which have long been solved, and which regular training would make familiar, they wish their sons to start without the handicap which they themselves had to carry. It is for this class of students that the new State technical schools are best suited. The expenses are light, and the schools have the advantage of being within easy reach of the class that needs them. High engineering training, on the other hand, means a heavy initial outlay, and from three years upward of time spent after acquiring the common English or collegiate education; and even then there must follow the probation period of actual practice before the graduate really becomes an efficient engineer.

The schools supported by the mining States, particularly in the West, can not, of course, at once compete with the older and richer institutions of this country and Europe in point of laboratory outfit, testing-plant, etc., but they have their own field of usefulness. Perhaps their greatest danger is the tendency to plan a course too much in the direction of high science, and in the pursuit of this ideal to sacrifice more immediately attainable and fruitful objects.

In mining and metallurgy as well as in all other professions, there is always room at the top, but this is small encouragement for the young graduate. What he needs is simply such a ground-work of general information and a thorough instruction in the every day routine of a mine, mill or furnace as will fit him for immediate, paying work. What the mining industry most needs is a class of intelligent foremen, surveyors, assayers, and draughtsmen, and, better still, men who can combine these different functions. The country is now well supplied with specialists and experts. It is the non-commissioned grade which ought to be brought up. The day for rule-of-thumb work or sheer guessing has passed. The Michigan Mining School, the recent catalogue of which serves as our text, has been judiciously planned, has the advantage of being located in the heart of the leading copper and iron mining region of the country, and is backed by a progressive and liberal State. It will shortly have a new building, and will be provided with a fair equipment. Let those in charge of this and similar schools remember their primary object—practical and simple training for local requirements. The higher theoretical instruction may be added in time if there is a demand for it; but the proper course for any institution dependent upon legislative appropriations is to demonstrate first that it supplies a want which the constituency of the legislature really feels. Grand courses with small classes are sure, in the end, to work popular dissatisfaction, which finds expression in the withdrawal of State support.

QUICKSILVER AND THE TARIFF.

The leading quicksilver producing companies of California have addressed a memorial to the tariff commission, in which they protest against putting the metal on the free list, and state the arguments for a protective duty. They say that instead of the 15 per cent ad valorem impost of a few years back the California mines, to be operated successfully, need a specific protection of 20 to 25 cents per pound. The paper is a strong document of its class, and whatever may be the opinions of law makers, consumers and the public for or against the policy of protection, they will find in this memorial an able plea for protection to quicksilver. Almost all other metals are protected, and if we are to adhere to protection at all, and no one suggests free trade, or believes it possible or desirable, it seems only fair that quicksilver should not be made an exception. Its production is one of the leading industries of the Pacific Coast. It employs about 5,000 men at fair wages, and it represents about $30,000,000 of capital. Quicksilver is a necessity in placer mining and in the mill process for gold and silver ores, though the smelting and leaching processes have of late years encroached upon the amalgamation method, while discoveries of free milling ores or ores suitable for amalgamation after roasting are becoming rarer and rarer. As the mercury used in this way is handled over again several times before being lost, it is not a heavy item of expense, and the precious-metal mines could easily stand the small advance in prices the tariff may bring. A few years ago, thirty quicksilver mines were operated in California; now there are only eight, and these apparently are unable to earn more than a bare existence, though they are at the same time exhausting their resources of ore, and suffering deterioration of plant.

The California product has little market east of the Rocky Mountains, at present. The strong competition of the Almaden mines in Spain, worked under a thirty years' lease by the Rothschilds, and of the government mines of Idria in Austria has had a depressing effect upon the California mines, which have already the reduced demand for amalgamation to contend with, as the memorial says:

"Owing to the great extent and richness of the Spanish mine, as compared with any mines in this country, and the low rate of labor in Spain, the Spanish government can at any time produce quicksilver in sufficient quantities to supply the consumption of the world, and at a price which would close every mine in this country; that the control of this Spanish product is a practical monopoly in the hands of Messrs. Rothschild, of London, who have a lease of the Spanish mines for thirty years, to secure the payment of a loan to that Goverenment; that there is a very large accumulation from the products of these mines now in London; that prior to the manufacture of quicksilver in California the price of foreign quicksilver was more than treble the present price, and that, should the California mines, which are practically the only competitors of the Spanish and Austrian mines, be, for want of protection, driven from the field, the price of the foreign article would be advanced to a rate that would compel the consumer of quicksilver in this country to pay a hundred fold more than the imposition of a duty on the American product would cost them. The admission free of duty of a product manufactured exclusively by foreign governments (which themselves have a high protective tariff), to the detriment and ruin of an American industry, is an anomaly in our revenue laws."

The main foreign outlet is to China, for the manufacture of vermilion, and to Mexico for metallurgical purposes. The demand for the manufacture of mercurial preparations used in medicine is not large, and the attempt to introduce quicksilver as a phylloxera preventive, and for similar purposes, has not stimulated consumption appreciably.

It is claimed by the memorialists that labor can be had in Spain and Austria at one quarter of the California rates; and that the metal can be delivered from Europe at New York at one quarter of the freight charge and in one third the time required from San Francisco. They also call attention to the 30 per cent duty on returned empty flasks from China, while filled ones imported are to come in free. It might be added that the leanness of the quicksilver ores now worked in California has much to do with the present unsatisfactory condition of the industry.

We are not in favor of artificially bolstering up hopeless enterprises, but our quicksilver mines form now an important industry and absolutely need this assistance to enable them to live in competition with those of the European governments, and it is to the interest of our miners to have such an independent source of supply and not be left again to the impositions of these foreign monopolies, which if our mines were closed could dictate prices.

COST ACCOUNTS.

An interesting paper under the above title, read before the Institute of Accounts by Mr. FREDERICK W. CHILDS, accountant to the firm of HENRY R. WORTHINGTON, and published afterward in pamphlet form, exhibits a simple and complete system of accounts, applied, for the sake of illustration, to the business of manufacturing steam engines, but equally applicable, with appropriate modifications, to any manufacturing business. Mr. CHILDS'S paper presents all the blanks and forms necessary for a complete analysis and report of the elements of manufacturing cost, distinguishing the labor, material and expense, and avoiding unnecessary and whimsical subdivisions. The purpose kept in view is to show, "with reasonable accuracy, how money value leaves a factor in each machine or part thereof." More than this may be curious and interesting, but is not necessary; and experience shows that excessive elaboration of such accounts is likely to result in neglect of them altogether. It is much better to undertake a simpler work, and to do it thoroughly.

We do not propose to discuss the details of Mr. CHILDS'S system, which, indeed, is not put forward by its author as necessarily the best, but only as one which has worked well in practice. We call attention to it in the belief that other accountants, dealing with similar problems, may find its suggestions valuable. But we chiefly desire to emphasize the necessity, in every large manufacturing business, of a thorough system of accounts.

This is perhaps the weakest point in American practice. It is not uncommon to find, even yet, large establishments which have been built up from small beginnings by energetic and thrifty proprietors, who began by carrying their whole business in their heads, and still think it unnecessary to keep any thing more than the ordinary mercantile books. Such men never know exactly "where they stand." They carry a large "factor of safety" in their accumulated capital and the instinctive

knowledge of business conditions, bred of long practice. But when business conditions change, or younger men, without this acquired instinct, assume control, the old concern begins to lose ground; and the old proprietor wonders what can be the reason.

We remember hearing the late PETER COOPER say that his way of carrying on business used to be, to pay, every Saturday night, all that he owed in the world. Then he knew that what was left in his pocket was his own. And the dear old gentleman added, with a wise shake of the head, that he still thought that was the best way! The great house which had grown from his early enterprises was fortunately not conducted upon this single-entry system.

The subject of accounts should be taught in our technical schools; and we believe that attention is given to it in most of them. But it should not be expected of the technical manager that he should actually perform the book-keeping. Without a sufficient knowledge of that science to understand the story told by the books of the business, he would certainly be incompetent to conduct it. Nevertheless, in any large establishment or enterprise, the accounting department should have an expert head. This has come to be recognized by railroad and insurance companies; and it is more and more pressed upon the attention of all modern manufacturers. Perhaps the greatest temptation is to cut down the working force in this department, so that the head of it is swamped with details, or the work of it is habitually in arrears. Such mistaken economy will be sure to avenge itself in the long run. The sharp competition of the present generation makes it imperatively necessary that every manufacturer should know, at any moment, exactly what is his condition and margin of profit. Really able professional accountants are likely to be more and more in demand. Even for those whose business does not require constant employment of an expert of the highest order in this line, a periodical auditing by such authority would be highly desirable. The existence and activity of the Institute of Accounts, a society composed of auditors, accountants, actuaries, book-keepers, cashiers, office-managers, etc, is an evidence of the growing importance of this occupation, and its rapid advance to the position which it deserves as a distinct and honored profession.

CORRESPONDENCE.

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

Furnace Charging-Bell.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: We would like to make a statement regarding furnace-charging bell shown in your issue of April 21st.

The illustration is a copy of one of our regular drawings, made in our office while Mr. Roberts was in our employ, and the clever application of the link to secure vertical motion in one line was suggested and worked out by Mr. Carlinet, one of our draughtsmen.

The other features have been developed at various stages of our practice, and have been used for all furnaces built by us.

GORDON, STROEBEL & LAUREAU, Limited.

PHILADELPHIA, May 1, 1888.

NEW PUBLICATIONS.

Dr. Stolzel's Metallurgie.*

In reviewing this important work of over 1600 closely printed octavo pages we must bear in mind that it is meant to form part of a technological encyclopedia, and thus suffers from the accumulation of detail that is inherent to such publications. But, if on the one hand we overlook the presence of a mass of now obsolete matter printed, we should say, merely to avoid the charge of incompleteness, we must, on the other, express additional surprise at the numerous omissions, and at the really lamentable poverty of some chapters. The book is so long and contains such an abundance of material that it would be impossible to review it in detail without devoting to it more space than we can dispose of. It seems to us, therefore, best to consider its value to American students and metallurgists in such a way as to enable them to compare it with such standard works of reference as Kerl, Plattner or Balling.

For nearly twenty-five years Dr. Stölzel has been accumulating details on all matters relating to metallurgy (chiefly from German sources) with a professor's assiduity and conscientiousness, but also with his characteristic disregard of the practical value of the information collected. The result of this lack of discrimination is a very scientific treatise, the theoretical part of which is remarkably thorough and complete, the practical part of which, however, is diffuse and, we fear, not always reliable. From a more practical man we should expect advice suggested by his experience; a comparison of different processes with some charge to the jury, for or against; and, what is of great value to the metallurgist, some record of notable failures to guard against, with an analysis of the cause of failure—which is only too often not to be foreseen from the data. Nor does the very complete list of books of reference, covering 86 pages of print, atone for this lack of practical advice.

The opening chapter, dealing with the properties of metals, is well done, exhaustive and the best in the book; yet it does not seem to us either as clear or as practical as Balling's excellent treatise on the chemistry of metallurgy, published in 1882 as a prefatory volume to his subsequent *Metallurgie*. The short chapter on ores and ore deposits is of course merely a short review of little value in itself, and in which we are annoyed by the small attention paid to American localities; indeed the whole modern development of the American mining and metallurgical industries is badly neglected throughout this work, and we read with surprise the old stereotyped names, many of which are already forgotten in this country, and references to which we find in the oldest foreign treatises.

It may be nothing more than Yankee conceit that prompts us to believe that we are important factors in the mining and metallurgical world, and perhaps we are not as interesting as we believe ourselves to be; still we *have* done something, we *are* somebody, and it is time that representative men give to the world an account of what we have done.

In a work of such dimensions we should expect the chapters on slags, flue dust, etc., to be more complete; the data wherewith to enlarge it are scattered through other special chapters, but they are difficult to find and compare, and would certainly bear repetition when necessary.

In the light of our American practice the whole chapter on the mechanical preparation of ores is decidedly bad. The contrivances described are very, very old, and *we* should think them very inefficient. Wooden stamps, tip-hammers, low speed rolls and Chili mills belong, as it were, to the colonial period of our metallurgical history, and here especially would we protest against the neglect of American machinery by the author, who does not mention a single one of our numerous contrivances for crushing, sizing and concentrating. Even the more modern German machines, such as, for instance, the Linkenbach buddle are not mentioned. The following chapters on roasting, furnaces, blowers, heating and metallurgical appliances in general are practically the same as in Kerl, whose cuts are reproduced. Here also American practice is ignored. The treatment of iron and steel is a new departure in German works on metallurgy, and Dr. Stölzel has written a very complete and exhaustive paper on the European methods, giving many interesting and valuable data, though I doubt whether it would stand a comparison with Gruner's or Percy-Wedding.

Copper is also treated solely from the European, chiefly from the German, standpoint. Of the 56 analyses of copper, not one refers to American products. Water jacket smelting is alluded to as a new process just being introduced and tried (Pilz furnace). Of the American water jacket not a word is said. Manhés' Bessemerizing apparatus is also omitted, although on p. 669 Dr. Stölzel credits Semmennikow with the invention. The process is described at some length and finally condemned as "not advantageous," although before the book was printed some of the satisfactory results achieved by the Manhés method had been made public both in France and in this country. Yet in contradiction to these omissions, the primitive processes used in India, Japan and Manilla are described at length. In the hydrometallurgy of copper more adequate mention is made of foreign (not German) processes.

Maine, Colorado and Missouri are given as the main tin producing States in this country.

The data on the lead industry of this country are of little value to-day, for Dr. Stölzel seems to have derived nearly all his information from Raymond's reports up to 1877, and the latest does not extend beyond 1879, since which time, it is needless to say, the conditions have completely changed; so that, although considerable space is devoted to American practice, the figures given have little but historical interest. Silver Islet, for instance, is mentioned as an active property, and the processes are described as if in actual operation.

The chapter on silver is more complete, though here again much of the information is become obsolete. The old abandoned Brückner diaphragm is given as in actual use, whereas several new arrangements of this furnace are not mentioned. The printed record of Stetefeldt's furnace dates back to 1881, since which time many important improvements have been made. But then most of the data seem to be taken from Prof. Eggleston's papers. The wet processes for the treatment of gold ores are very briefly mentioned, a great many being entirely left out. Cassell's electric process, which failed to yield satisfactory results, either here or in England, is described without adverse criticism. In the chapter on antimony the statement (copied from Kerl) is made that antimony is reduced from roasted ore and refined in one operation in a reverberatory, whereas the process was in operation only a short time—a few weeks possibly—and was abandoned about 15 years ago.

But withal, if there are mistakes and omissions, it must not be supposed that the book is not a good one. For European practice it is probably ahead of any single work which has yet appeared. As a general book of reference Stölzel is more complete than Kerl, and does not constantly refer you to what, after much trouble, you discover to be merely a notice of no interest or value. A few weeks ago Prof. Richter told me in Freiberg that he thought highly of the work as a book of reference; as a text-book it was too full of detail and perhaps often not sufficiently clear to beginners. To American students it has little practical value, and with Kerl, Plattner and Balling on the shelf is perhaps hardly worth adding to the German contingent.

JOHN HEARD, JR.

*Die Metallurgie von Dr. E. Stölzel. Braunschweig. 1863–1886. Verlag von Vieweg und Sohn. To form the seventh volume of Bolley-Birnbaum's Chemical Technology. 1628 pp. + a supplement of 86 pp. octavo.

Electric Traction in Austria.—The Vienna correspondent of *Industries* says that Herr Fischer, a civil engineer of that town, has obtained a concession for an electric railway between Vöslau and Rauhenstein, near Baden, and from there to Leopoldsdorf. The length of the line being considerable, Herr Fischer will probably use storage cars. Julien accumulators are now being tested in the Electrotechnical Institute, and a trial of these cells for tramway work in competition with Reckenzaun cells will shortly take place. A central station for the supply of electricity has recently been erected at Neuhaus, in Bohemia. The contractor is Count Czernin, a landowner in that district, and he has arranged for the supply of light to the Commune for 20 years. Power is obtained from a turbine, and there are at present two dynamo machines installed. The distribution is on the three-wire system with feeders. All the leads are carried on poles overhead. The streets are lighted by 85 16 candle-power glow lamps, and in private houses there are at present 365 lamps fixed, but the demand is constantly increasing. To provide against breakdown a battery of 1000 storage cells is now being laid down.

ARTESIAN WELLS.

Prof. T. C. Chamberlin's admirable essay on Artesian Wells, printed with the fifth annual report of the United States Geological Survey, contains so many interesting points and is so concise that it loses greatly in abstract and we refer such of our readers as desire fuller information than our space permits us to give to the original report for a better understanding of the subject. While Professor Chamberlin modestly disclaims any attempt at a complete monograph, the paper is the most thorough that has come to our notice so far as stratigraphical considerations are concerned. It is on the theoretical, prediction side that the practice of artesian well boring is weakest. The art of sinking deep drill holes has been developed to an extraordinary extent since the introduction of deep bores for petroleum, natural gas and brine, or for prospecting for coal and iron; and in boring for artesian wells the methods are in the main similar to those followed in the other industries. But with artesian wells the application of the principles of economic geology and stratigraphy yields relatively better results than in the case of oil or gas, as to which geologists and prospectors are still largely at fault, and the prospect of success under skilled direction is steadily becoming more certain. Practical drillers and water consumers can be greatly assisted by professional advice, with the saving of hopeless expenditure on the one side, and the opening of profitable wells in untested localities on the other.

Those who think that the geological conditions of artesian wells have been exhaustively treated by the text-books will be surprised to discover how many possibilities are involved, and of these how many have escaped comment in any systematic shape. The general principles are pretty commonly understood, and, taking one case at a time, the conditions are simpler and more easily grasped than in most similar branches; but an unexpected variety of occurrences and combinations of features appears when they are brought together in such a discussion as that presented by Professor Chamberlin. In this issue are reproduced the ideal sections, showing some of the different possible occurrences, with the reason for failure or success, and also some illustrations of appliances used. Most of the cuts are sufficiently intelligible on reference to their titles.

The features of an artesian well are rainfall, source and head, protected underground waterway, the bore itself, and the final discharge. The seven primary requisites laid down by the author are:

I. A porous stratum to permit the entrance and passage of the water.

II. A water-tight bed below to prevent the escape of the water downward.

III. A like impervious bed above to prevent escape upward; for the water being under pressure from the fountain-head would otherwise find relief in that direction.

IV. An inclination of these beds so that the edge at which the waters enter will be higher than at the surface at the well.

V. A suitable exposure of the edge of the porous stratum, so that it may take in a sufficient supply of water.

VI. An adequate rainfall to furnish this supply.

VII. An absence of any escape for the water at a lower level than at the surface at the well.

These principles are self-evident and are generally understood; but in discussing them in detail a number of new points come up. The water-beds are broadly divided into two classes by the author. One comprises the close-textured rocks in which fissures and open channels occur. To this class belong the igneous and metamorphic rocks and limestones, the latter sometimes containing channels formed by solvent waters. The chances of striking such open passage-ways is very small, as they are few, uncertain and easily choked up. Even with torpedoing they seldom furnish an adequate supply. As regards the open ways in limestone, which are of such interest to silver-lead miners, Professor Chamberlin remarks that the solvent waters lose their potency not far from the surface, and that the healing up of fissures by calcite in depth shows that there such waters have become precipitating rather than solvent agencies. The second class embraces beds of open texture, such as gravels, conglomerates, coarse sandstones, and some porous chalks and granular limestones; and the best wells generally tap such water carriers. The porosity is interstitial, not vesicular.

The character of the covering bed is of more importance than that of the under bed. Fine drift clay, clayey shale, and close-grained sandstones form the best caps. The under bed usually outcrops at a higher level than the water bed (Fig. 6) unless affected by erosion (Fig. 7).

The points of fresh interest most dwelt upon by our author are the efficiency of a water cover as a substitute for an impervious capping; high ground and water surface between the head and the well; the advantages of gently tilted and uncontorted beds over those of steep dip; the character of the surface mantle over the upper edge of the water belt; the effects of erosion at its cropping on the available catchment area, and some other details which the cuts bring out. The water-level, as is familiar to miners, is irregular, but follows in a measure the ground surface; that is, it rises with increased surface altitude, though not to the same extent, and conversely falls as the ground surface becomes lower. High ground over the water-way between the source and the well is therefore an advantage in two respects—a better rock capping, and increased water cover.

The geological age of the beds, especially of the sandstone water-carrying strata, has a good deal to do with their porosity. The Quaternary are more open in texture than the Tertiary, and so on back. This is a matter of common observation, and would be anticipated from purely theatrical and *a priori* considerations. The chief exception is the Potsdam sandstone of the Upper Mississippi Valley, which makes an excellent conveyor.

It is shown that while a basin might be expected to offer the ideal conditions for artesian wells, it is not always necessary that the water bed should not outcrop beyond the well at a lower level, if its carrying power can be checked. The coarse sandstones and conglomerates are shore or shallow soundings deposits, and are apt to shade into finer and finer beds toward the sea in which they were laid down; and these latter beds are sufficiently impervious after being converted into hard rock to stop the flow of water. Perfect conditions are not to be looked for, but a certain amount of loss by leakage can be met successfully if there is sufficient margin of supply.

Some popular misconceptions are corrected—as, for example, the idea that lakes or subterranean pools are likely sources of supply for artesian wells, the facts being that the former are usually silted with an impermeable floor or they could not exist, while the latter are rare and generally without head. Also, the undue importance attached to high pressure, which is largely ascribable to the disproportionate vertical scales given in most text-books for the sake of making the diagrams more striking. The illustrations we reproduce are also necessarily made to two scales, but the vertical exaggeration has been greatly reduced. Fig. 2 gives a better idea of the actual dip of the well strata of the Mississippi Valley, and shows how little fall is required. The steeply inclined beds, moreover, have to be tapped at great depths when bored upon at any distance from their outcrop.

The rubber packing shown in Figs. 26 and 27 needs no explanation. Fig. 25 gives a view of an ingenious device which has been used for a long time to prevent the escape of water around the tubing, so as to control the discharge by suitable valves or other appliances in the tube. It is a cylindrical leather bag tightly attached to the lower end of the tube, and is filled with dry flaxseed before sending down. The absorption of moisture swells the seed and effectively plugs the space outside of the tubing.

It often becomes necessary to test the wells, and this may be done before the drilling is finished. Even though no surface flow is obtained on tapping the water-carrying strata, some indication of a possible supply is frequently given by a partial rise of water in the bore, by the character of the drill chips brought up by the sand pump, or by the effect on the drilling tools. To ascertain whether a flow can be had by cutting off leaky strata, etc., a packed test tube is inserted, the packing being sent down to the proper level. Figs. 22, 23, and 24 show how such tests may be negative, misleading, inverted or reliable, according to the levels tapped and plugged. The greatest care is required in making such tests where there are two or more porous strata separated by compact beds, as a variety of conditions may arise depending mainly upon the outcrops of these beds and their relation to each other, which would render the tests deceptive. The reader is referred to Professor Chamberlin's paper for a detailed discussion of this matter.

MICA MINING IN NORTH CAROLINA.—III.

Written for the Engineering and Mining Journal by Wm. B. Phillips.

(*Continued from Page* 307.)

The free play which the crystallizing forces enjoyed between the enclosing walls of the vein is one of the remarkable phenomena to be observed in these mica mines. Nowhere else can this be seen on such a scale. The development of a single mineral within a vein is not uncommon, but the wholesale crystallization of all of the chief constituents of a vein is very infrequent. It is worthy of notice here that in a mica vein these constituents are highly siliceous. Taking the percentage of silica in the quartz as the standard, we have the percentages of silica as follows:

	Per cent.
Quartz	100
Feldspar (orthoclase)	64·72
Mica (muscovite)	45·75 to 51·80
Garnet	35·00 to 52·11

Garnet is here included because, although it does not occur in large crystals, it is nearly always present, and in considerable quantities, sprinkled in the quartz. This, so to speak, excessive extension of the crystals would seem to imply that they met with but little resistance, or that the resistance was easily overcome. W. C. Kerr was of the opinion* that many of the irregularities of these veins, in form, size and position, were due to the efforts of the vein matter to intrude itself. These irregularities, however, seem to me to be chiefly due not to this cause but to the original fissuring forces. It may indeed be true that in the attempt to *crystallize* the vein matter caused some irregularities in the shape and size of the fissure, but this is a force different in kind and degree from the intrusive force referred to. In the work of intrusion the temperature of the intruding mass would have been lowered. As this process went on, and more and more work was accomplished, the temperature would tend more and more towards the point at which crystallization would set in, unless a new source of heat was at hand and available. The amount of heat given out by the solidifying vein matter would of course be the same as was absorbed by it in first assuming the liquid state. Whether the amount of heat equivalent to the effect of intrusion would be less than equal to or greater than the amount thus set free is a question upon which I do not now propose to enter. The subterranean forces causing the ascension of the vein matter in a liquid or semi-liquid condition could have forced it into the various ramifications of the fissure and have thus left it to follow its own crystallizing tendencies. That there was little or no hinderance to it in passing to the solid state is shown by the size of the resulting crystals. The great and extended irregularities in these veins I would therefore attribute primarily to the original fissuring forces, the small and more local ones to local causes, among which may be included local intrusion and local crystallization.

At whatever point within the fissure we consider the vein matter, whether before or after crystallization, it will appear as completely filling it. A "horse" within a mica vein is seldom met with. There is one at the Sink Hole mine. Here the inclosing rock is mica schist, and the following succession of substances has been observed from wall to wall:* 1st, mica; 2d, a "horse" of mica schist; 3d, smoky quartz; 4th, mica; 5th, smoky quartz; 6th, a "horse" of mica schist; 7th, mica.

The deposit of mica between the "horse" and the wall is narrow, but yields good mica. The greater part of the mica in the vein crystallized first, and probably in this process tore off a piece of the wall, the space left by it being subsequently filled with mica. The pieces torn off are somewhat more decomposed than the original walling.

The direction taken by the mica crystals is not without interest. As a rule the plane of crystallization, parallel to the laminæ of the mica, is

* ENGINEERING AND MINING JOURNAL, Vol. XXXI., No. 13, p. 211.

* W. C. Kerr, *ut supra*.

FIG. 1.—Longitudinal section of a stream illustrating in part its upward currents subordinate to the general downward flowing, and showing how water runs up hill.

FIG. 2.—Section of the Chicago artesian stream drawn to a nearly true scale. The full line represents the ground surface; the dotted line the water bed, whose supply is from south-central Wisconsin.

FIG. 3.—Ideal section illustrating the chief requisite conditions of artesian wells. *A*, a porous stratum; *B* and *C*, impervious beds below and above *A*, acting as confining strata; *F*, the height of the water level in the porous bed *A*, or the height of the fountain head; *D* and *E*, flowing wells springing from this porous water-bed *A*.

FIG. 4.—Section illustrating the thinning out of a porous water-bed *A*, inclosed between impervious beds *B* and *C*, thus furnishing the necessary conditions for an artesian fountain *D*.

FIG. 5.—Section illustrating the transition of a porous water-bearing bed *A* into a close-textured, impervious one

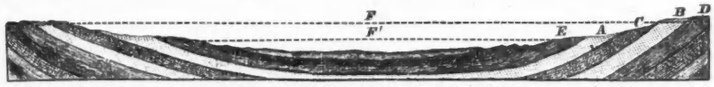

FIG. 6.—Section illustrating the usual order in which the strata of a basin come to the surface. *A* and *B*, porous beds; *D* and *E*, impervious beds; *C*, a half-impervious bed; *F'* and *F*, the water-levels of *A* and *B* respectively.

FIG. 7.—Section illustrating the possible effect of erosion upon strata originally like those in Fig. 6. If the stratum *C* is not practically a confining layer, the water from *A* will pass through it and escape at the edge of *B*, so that a flow can not be obtained at a higher level than it, but may be had below the line *F'*.

FIG. 8.—Section illustrating the failure of an artesian well because of defects in the confining bed below. *A* and *B*, porous beds; *D* and *I*, impervious beds; *C*, a defective confining bed; *E*, the water-level of the stratum *B*; *G* and *H*, wells that do not flow. The bed *A* might give a flow at *G* and *H*, but for the defect in *C*, which permits the water to descend into *B* and escape through its outcrop, which lies below the surface at *G* and *H*.

FIG. 9.—Section intended to illustrate the aid afforded by a high water surface between the fountain head and the well. *A*, a porous bed; *B*, confining bed below; *C*, confining bed above. The dark line immediately below the surface represents the underground water surface. Its pressure downwards is represented by the arrow *m*; the pressure upward due to the elevation of the fountain head is represented by the arrow *n*. The line *F* represents the level of the fountain head. There can be no leakage upward through the bed *C* except near the well *D*. There may be some penetration from *C* into *A*, which would aid the flow.

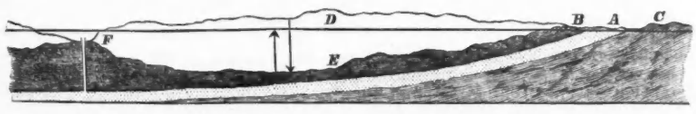

FIG. 10.—Double section illustrating the effects of high and low water surface in the cover area.

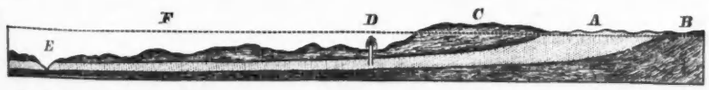

FIG. 11.—Section illustrating the possibility of a flow from a bed even when exposed at a lower level. *A*, a sandstone bed, thick and coarse at the right (its shore edge), and thinner and finer at the left; *B* and *C*, confining impervious beds; *F*, the water level in *A*; *D*, a well which may flow, notwithstanding the lower exposure at *E*.

FIG. 12.—Section showing the difference between a highly inclined water-bed and a gently tilted one in catchment area at the outcrop.

FIG. 13.—Illustrating a common effect of erosion upon the surface area of the porous stratum, and the contour of the resulting basin. Dotted lines show the original contours.

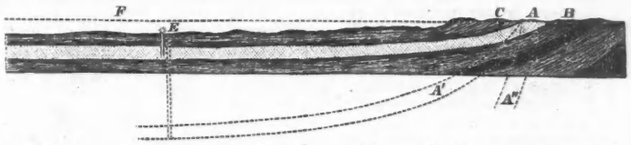

FIG. 14.—Section illustrating the advantages of low inclination. *A*, a porous bed; *B* and *C*, impervious beds; *A'* and *A''* indicate porous beds of higher dip.

FIGS. 15 AND 16.—Tabular sections of strata, showing disadvantageous arrangement of wells.

FIGS. 17 AND 18.—Tabular sections of strata, showing advantageous arrangement of wells.

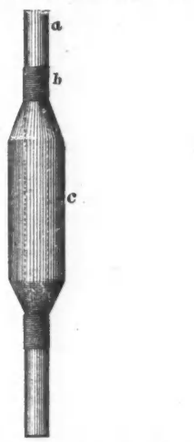

FIG. 19.—Seed bag: *a*, delivery tube leading to the surface and terminating below the seed bag; *c*, a leather bag filled with dry flaxseed; *b*, marline wrappings to secure the end of the seed bag.

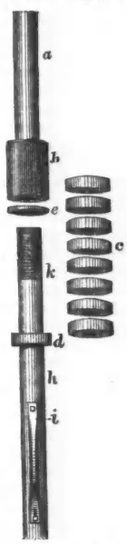

FIG. 20.—Rubber packing shown apart. *a*, section of delivery tube extending to the surface; *b*, a large thimble into which *k* screws; *e*, an iron washer; *c*, a set of rubber disks fitting on *k* between *b* and *d*; *k*, a section of pipe on which is turned a long screw fitting in the thimble *b*; *d*, a disk forming the head of the screw *k*; *h*, a section of pipe extending about 2 feet below the packing; *i*, a spring to press against the walls and hold the pipe *h* while the section *a* and the thimble *b* are screwed upon *k*.

FIG. 21.—Rubber packing shown screwed together as it is in the well.

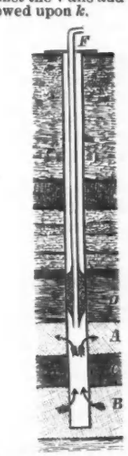

FIG. 22.—Section of a well illustrating a negative test.

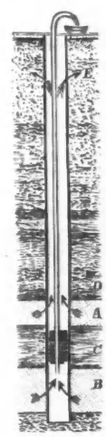

FIG. 23.—Section of a well showing a partial and misleading test.

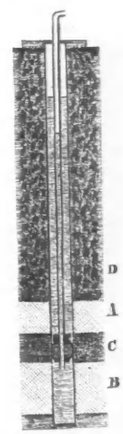

FIG. 24.—Section of a well illustrating an inverted test.

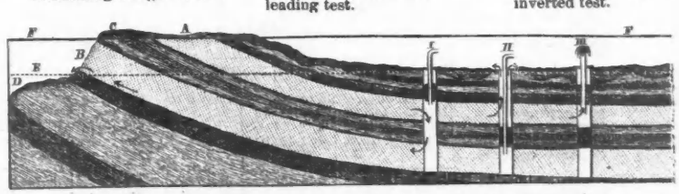

FIG. 25.—Section of strata and three wells, showing one correct and two erroneous tests. These wells are assumed to be independent of each other, and are placed together merely for convenience.

THE CONDITIONS AND OCCURRENCE OF ARTESIAN WELLS.

more or less inclined to the line of strike, being frequently perpendicular to it, so that the mica on being uncovered resembles a pile of thick planks laid flat on the sole of the level. I do not recall an instance of a contrary arrangement, *i. e.*, of a parallelism between the plane of lamination and the line of strike. The tendency is strongly the other way.

An interesting question here is whether the mica, feldspar, quartz, garnet, etc., existed as such within the vein, and had only to segregate themselves by crystallization, or whether they are to be regarded as forming within the liquid mass highly complex silicates, which crystallized according to the chemical affinity of their constituents under the existing circumstances. According to the first view, the mica probably existed as $H^4K^2(Al^2)Si^6O^{24}$, the feldspar as $K^2(Al^2)Si^6O^{16}$, the garnet as $\overset{II.}{R^3}\,\overset{VI.}{(R^2)}\,Si^3O^{12}$, where R = Ca, or Fe, or Mg, and $(R^2) = (Fe^2)$ or (Al^2), and the quartz as SiO^2. They existed *as such*, and had only to crystallize to become visible.

According to the second view, the potash, alumina, lime, magnesia, iron and silica were all in a state of aqueo-igneous fusion together; some of the potash and alumina lay hold of the requisite amount of silica and became mica; another portion of potash and alumina and silica formed feldspar, etc.; the portion of silica not needed for these compounds finally cyrstallized as quartz. In neither case could crystallization occur until the critical point (congelation point) for each substance was reached.

The various chemical elements in the vein matter would at the moment of crystallization have affinities influenced by the temperature, pressure, etc., and these affinities might or might not be the same as at ordinary temperature and pressure. That a high heat does influence chemical combination is a fact too well known to be more than restated. Thus it is well known that at a glowing heat oxygen has a greater affinity for carbon than for either hydrogen or iron, strongly as it tends to combine with these two elements. The chemical affinities existing between a number of elements under the circumstances of heat and pressure in a liquid mass from which mica, feldspar and quartz were afterwards to crystallize might well be different from what would obtain if the limiting circumstances were withdrawn. Potash, alumina and silica do not combine at ordinary temperatures, nor do lime, iron and silica.

Whatever the affinities between these substances might have been before crystallization, when this process was once established it went on to form perfectly definite compounds. Which one crystallized first is not so quickly said. From evidence now in my possession, I am inclined to believe that the mica crystallized first. I was led to this conclusion, not by theoretical considerations, but by having found in a mica vein a piece of quartz having on it evident impressions of the edges of a block of mica, forming a sort of pyramid with microscopic steps; inclosures of quartz between the laminæ of mica, the quartz being almost as thin as the mica; inclosures of feldspar in mica also very thin, and lying pressed between the mica sheets.

These three circumstances taken in conjunction would seem to indicate a crystallization of the mica prior to that of the quartz or feldspar. A synchronous crystallization would have given a mass more nearly resembling granite, in which each substance has interfered with the other. So far then as the moment of crystallization is concerned, a mica vein differs from granite in having suffered a succession of crystallizations instead of synchronous crystallization. Had the mica, feldspar and quartz all crystallized at the same time, there is no reason why there should not have been granite in the fissure instead of a mica vein.

(TO BE CONTINUED.)

CHEAP MINING AND MILLING.

We give herewith detailed statement of costs of working at the Spanish gold mine, Cal. While the mine is not operated on a large scale, it has the advantage of water power and of having soft ore at and near the surface and easily run into the mill. Taking the costs per ton for mining and milling together, this report beats the record for close figuring, and is in its way as remarkable as the famous run of the North Bloomfield hydraulic mine. It would hardly be fair to compare the results with those at the Homestake or the Tredwell, Alaska, mines on the one hand, nor with drift, cement, and "branch" mines on the other.

In its own class of low grade ores the Spanish mine has made a record to be proud of. The lowest mine cost per ton was 31·4 cents, and milling cost 20·8 cents, or 52·2 cents per ton total, in November, 1887. The highest total mine and mill cost per ton between September, 1887, and March, 1888, was 60·6 cents, and the monthly returns were pretty regular. Even at these rates the margin for profit is not large.

The following information is furnished us by Mr. F. W. Bradley, the lessee of the mine, and it will undoubtedly attract attention:

I inclose copies of the December and February reports of our work and statements taken from the ledger showing amount of labor in each department. Neither the December nor February report is a fair showing of what the mine can do as, during a portion of December and nearly all of January the mill was shut down on account of a failure of the water supply due to the excessive cold spell of that time.

We are able to handle ore here cheaply because we are mining a large deposit of soft slate that crops out from 30 to 100 feet in width on the face of a steep mountain. This slate is seamed in every direction by small stringers of quartz. There is a little gold in the slate, some in the quartz, and considerable in a loose free state in the clay parting between the quartz and the slate. The formation has a pitch of about 80 degrees from the horizontal.

When the weather permits, the mining is done in open cuts on the croppings over the main working tunnel which starts from the surface immediately at the top of the mill building and follows the course of the deposit into the mountain. During stormy weather, ore is obtained from accumulated supplies and by stoping the best portions of the deposit over the tunnel and replacing the same by square sets of timber in such a manner as to form ore bins for storing and loading into the tunnel cars ore broken in the cuts. In the cuts, the softest streak near the foot-wall is stoped by Chinese miners. Ore left on the foot-wall soon slacks off and ore on the hanging-wall and also portions of the hanging wall cave in. All waste is separated as much as possible from the ore, and left in the worked out cuts, there being a strong pillar left at the end of each cut. The tunnel has a grade of 2½ inches to 16 feet. A brake on the last car controls a train of ten loaded cars coming out, and a mule easily hauls back the empty train.

The following items give an idea of our milling plant:

Four Huntington mills and self feeders	$6,346 22
Labor, setting up and building	2,304.83
Silver plated amalgamating plates	1,985 35
Water pipe and wheel, shafting and pulleys	1,220.75
Lumber, building, and V-flume	1,194.52
Hardware	1,026.08
Blake crusher	618.45
Cost of milling plant under cover, and running	$14,696.20

Freight, $24 per ton from San Francisco; lumber, $22.50 per thousand.

The mills crush from 120 to 140 tons per day, depending upon the proportion of quartz in the ore. We amalgamate inside the mills, obtaining 45 per cent of the gold saved around and inside the mills, and 55 per cent on the plates. The tailings are not touched after leaving the plates. We lose 1 ounce of quicksilver for 16 to 31 tons of ore crushed, depending upon its value.

Experimenting with screens we have used a No. 6 slot for a long time, and are now using a No. 5 slot.

I think that the Huntington mill is peculiarly adapted for working this ore, and am satisfied that with stamps the mine would not pay.

The following is a statement I prepared for Mr. Huntington December 21st last, concerning the work of his mills; it gives some additional particulars:

F. A. Huntington, Esq.:

DEAR SIR: Your mills have been in operation here for nineteen months, but a record of their work has been kept for only the past fifteen months. For the first ten months of this time, one 5-foot mill and one 4-foot mill crushed 17,200 tons of ore; five months ago, two 5-foot mills were added to the plant, since then the four mills have crushed 19,402 tons. The ore, of which 27 cubic feet is called a ton, consists of about one third hard quartz, one third tough slate and one third decomposed quartz and slate.

The four mills require 22 horse-power, are running at 60 revolutions per minute, and are discharging through a No. 6 slot screen. During the last four months the mills have averaged 136 tons of ore per day.

The item of 2 cents for renewal of working parts is too steep, but it provides for all possible contingencies. I think your mill saves more gold and flours less quicksilver than stamps.

F. W. BRADLEY, Supt.

THE DEVELOPMENT OF THE AMERICAN CHEMICAL INDUSTRY.*

By Dr. Francis Wyatt.

(*Continued from Page* 305.)

THE LEBLANC PROCESS (HYDROCHLORIC ACID).

In our preceding chapters we have endeavored to avoid any possible source of confusion or complication by concentrating our attention upon the sodium sulphate produced by the action of sulphuric acid upon salt, and have made merely incidental mention of its accompanying important by-product. Having now disposed of the first, however, we may proceed to consider the most practical methods of dealing with the second, but before doing so may bestow a preliminary glance at its origin, its properties, and its various applications. Hydrochloric acid has been found in a free state in nature, in company with the various other bodies ejected by certain eruptive disturbances, its presence in such cases being attributed to the disintegrating action of water upon alkaline or earthy chlorides. Analyses by several good authorities have shown it to be also contained in the proportion of from one to two per thousand in some of the rivers of the South American continent which take their source in volcanic regions. Industrially, we may say that it is mainly produced by the process we are reviewing; chemically, it is formed in a number of different ways with which we have no present concern, and, under the name of "*spirit of salt*," had been already discovered in aqueous solution by Valentine, Boyle, and Glauber. In about 1773 Priestly first obtained it as a gas, and it was finally proved by Sir Humphrey Davy in

RESULTS AT THE SPANISH MINE, NEVADA CO., CAL

	September. 22 days, 2796 tons of ore.				October. 28 days, 3443 tons of ore.				November. 30 days, 4047 tons of ore.				December. 25 days, 2972 tons.				January and February. 36 days, 4256 tons.			
MINE	Labor.	Supplies	Total.	Per ton.	Labor.	Supplies	Total.	Per ton.	Labor.	Supplies	Total.	Per ton.	Labor.	Supplies	Total.	Per ton.	Labor.	Supplies	Total.	Per ton.
	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Mining	486.59	85.73	572.22	.205	703.50	113.41	816.91	.248	679.63	196.65	876 28	.217	458.64	101 20	559.84	.180	374.18	141.19	515.37	.121
Dead work	237.30	43.00	280.30	.10	105.29	10.93	116.13	.034	100.90	14.35	115 25	.028	230.22	20.29	250.51	.084	434.33	47.20	481.53	.113
Delivering ore to mill	126.00	10.70	136.70	.05	160 20	17.95	171.15	.05	193.25	13 69	206.94	.051	180.75	21.44	211.19	.071	239.85	23 00	262.85	.061
General expense	58.22	3.60	61.52	.02	78.35	1.95	80.30	.024	70.70	4.75	75.45	.018	69.26	3.24	72.50	.025	121.26	6.68	127.94	.03
Total	908.11	143.73	1050.84	.375	1047.25	144.24	1191.49	.346	1044.48	229.44	1273.92	.314	947.87	146.17	1094.54	.360	1169.52	218.17	1387.69	.325
Cost per ton	.324	.051	.375	....	.304	.042	.346	.....	.258	.56	.314	....	.318	.052	.368	.....	.274	.051	.325	....
MILL	20 days, 2796 tons.				24½ days, 3443 tons of ore				29 days, 4047 tons of ore.				23 days, 2972 tons of ore.				32 days, 4256 tons of ore.			
Mill expenses	163.45	143.10	306.55	.11	227.32	194.33	421.65	.122	225.67	162 82	388 49	.096	175.26	160.76	336.02	.113	239.49	242.27	481.76	.113
Water for power	....	152.20	152.20	.055	....	161.70	161.70	.047	5.00	198.00	203.00	.05	5.00	138.00	143.00	.048	5.00	201.00	206.00	.048
Handling ore	121.50	2.96	124.46	.045	154.56	5.35	159.85	.046	177.00	2.40	179.40	.044	152.25	3.24	155.49	.052	204.00	1.62	205.62	.048
General expenses	58.23	3.30	61.53	.02	78.40	1.95	80.35	.024	70.71	4.75	75.46	.018	69.26	3.24	72.50	.025	121.25	6.67	127.92	.03
Totals	343.18	301.56	644.74	.23	460.22	363.33	823.55	.239	478.38	367.97	846.35	.208	401.77	305.24	707 01	.238	569.74	451.56	1021.30	.239
Cost per ton	.123	.107	.23	....	.133	.106	.239	.....	.118	.09	.208	....	.135	.103	.238	....	.133	.106	.239	....
Total expenses		$1,695.58		.605		$2,015.04		.585		$2,120.27		.522		$1,801.05		.606		$2,408.99		.564
Bullion produced		3,268.49		1.16		3,138.55		.91		2,644.57		.65		1,950.85		.656		2,783.49		.654
Profit		1,572.91		.56		1,123.51		.326		524.30		.13		149.80		.05		374.50		.09

1809, after a lengthy contest with the French chemists of the Lavoisier school, to be simply composed of equal volumes of hydrogen and chlorine.

One of its most interesting features is the influence exercised over its formation by the action of light, and a very beautiful and instructive experiment may be performed in a darkened room to demonstrate this influence by mixing in a thin glass flask one exactly equal volume of each of the pure gases. While the obscurity is preserved no chemical action will take place between them, but directly that condition is changed, a combination, proportionate in its rapidity to the vividness of the light to which the flask is exposed, will at once take place. If it be softened and well regulated, the reaction will be slow and progressive, while if it be strong and sudden, such as that produced by the electric spark, or the burning of magnesium ribbon, the union will be sufficiently rapid to provoke a violent detonation. Whether the combination of the two elements be engendered slowly or rapidly, however, no change is thereby produced in their original volume, for 1 vol. H + 1 vol. Cl = 2 vols. HCl, and hence, since the specific gravity of hydrogen is to that of chlorine as 1 to 35·50, so the molecule of hydrochloric acid gas must weigh 36·50. Its specific gravity, therefore, as compared with hydrogen, is 18·25, and the weight of 100 cubic inches of it is 39·50 grains. The proof of these figures is by no means difficult of demonstration. An accurately measured volume of the pure hydrochloric acid may be introduced into a small tube placed over mercury; a tiny piece of metallic sodium is admitted to it through an orifice beneath the surface of the mercury by means of a small wire, and the flame of a Bunsen burner is applied. The reaction having completely ceased, exactly one half the original volume of gas will have disappeared through combination with the sodium to form common salt, while that which remains will be found to possess all the characteristics of pure hydrogen. Now, if we deduct the weight of the remaining half volume of hydrogen (0·50) from the specific gravity of the original volume of hydrochloric acid (18·25) we have 17·75, which exactly represents half the specific gravity of chlorine. Hence we consequently establish beyond controversy, that half a volume of hydrogen and half a volume of chlorine constitute one whole volume of hydrochloric acid, and that since the formula HCl precisely represents the proportion in which the substance reacts on a molecule of potassium hydroxide (KHO), it expresses at once both its molecular and equivalent weight, and is the only one we can reasonably admit.

Although it has not yet been solidified, it has been obtained as a colorless liquid under a pressure of 40 atmospheres, and in this form may not only be placed in contact with magnesium, zinc, iron, calcium, and all metallic sulphides without attacking them, but will generate no gas in its action on potassium, sodium, tin and lead. Being undecomposable by heat, it has the property of extinguishing flames, and is so extremely soluble in water, that one volume of that liquid will absorb nearly 480 equal volumes of the gas. So great, in fact, is the affinity between them, that if a glass tube filled with gaseous HCl be uncorked on the surface of water, the latter will rush in with sufficient velocity to burst it. This attraction for water at once explains the destructive action of the acid upon growing plants. It may be demonstrated by placing a spray of fresh leaves in immediate contact with it and noting how swiftly they will become brown and shriveled. According to some eminent writers who have devoted themselves to an investigation of its properties, HCl contains a true molecular hydrate of the probable composition, H_2OHCl, and its completely saturated water solution has a specific gravity of 1·21, and contains nearly 43 per cent of the pure gas. The absorbing powers of water, the different degrees of concentration, and the corresponding proportions of HCl in solutions of varying specific gravity will, however, be best illustrated by the following tables:

ABSORPTION OF HYDROCHLORIC ACID BY WATER.

By weight (after Roscoe and Dittmar).

One gram of water absorbs at the stated temperatures and at a pressure of 760 mm.

Temperature. Degrees C.	Gram of HCl.	Temperature. Degrees C.	Gram of HCl.
0	0·825	32	0·665
4	0·804	36	0·649
8	0·783	40	0·633
12	0·762	44	0·618
16	0·742	48	0·603
20	0·721	52	0·589
24	0·700	56	0·575
28	0·682	60	0·561

By volume (after Deicke).

One cubic centimeter of water absorbs at the same temperatures and pressure as above.

Temperature. Degrees C.	C. cm. HCl.	Sp. gr. of acid formed.	Percentage of HCl in same.
0	525·2	1·2257	45·148
4	497·7	1·2265	44·361
8	480·3	1·2185	43·828
12	471·3	1·2148	43·277
14	462·4	1·2074	42·829
18	451·2	1·2064	42·344
18·25	450·7	1·2056	42·283
23	435·0	1·2014	41·536

DETERMINATION OF THE STRENGTH OF HYDROCHLORIC ACID SOLUTIONS.

(According to their specific gravity and by Beaumé and Twaddle.)

At a Temperature of 45 Degrees Fahr.

Specific gravity.	Degrees Beaumé.	Degrees Twaddle.	Acid per cent.	Specific gravity.	Degrees Beaumé.	Degrees Twaddle.	Acid per cent.
1·21	26	42	42·85	1·10	14·50	20	20·20
1·20	25	40	40·80	1·09	12·00	18	18·18
1·19	24	38	38·88	1·08	11	16	16·16
1·18	23	36	36·36	1·07	10	14	14·14
1·17	22	34	34·34	1·06	9	12	12·12
1·16	21	32	32·32	1·05	8	10	10·10
1·15	20	30	30·30	1·04	6	8	8·08
1·14	19	28	28·28	1·03	5	6	6·06
1·13	18	26	26·26	1·02	3	4	4·04
1·12	17	24	24·24	1·01	2	2	2·02
1·11	15·50	22	22·22				

When the more saturated solutions are heated, they evolve an abundance of the gas HCl and are therefore not generally regarded in the light of true chemical compounds. When, however, they have been reduced by evaporation under a normal pressure to a specific gravity of 1·10, the evolution of gases comes suddenly to an end, and the compound thenceforth remaining uniform, subsequently loses acid and water in exactly the same proportions.

The industrial uses to which it has been applied, especially of late years, are various and important. Among them we may mention the manufacture of chlorine for bleaching powder; the chlorides of ammonium and antimony; potassium and other chlorates; gelatine; phosphorus, carbonic acid, bi-carbonate of sodium, purification of bone ash for sugar refineries, glucose, extraction of copper, nickel, cadmium, zinc and bismuth by the wet process, precipitated phosphates of lime for fertilizers, nitro-muriatic acid, prevention and destruction of boiler scale, purification of sand for glass manufacture, preparation of refractory clay, and purification of coke. It is also largely employed in the calico industry for decomposing the soaps of lime, and in the regeneration of sulphur from alkali waste.

How to best and most economically effect its condensation and facilitate its recovery from the gases generated in the manufacture of salt cake was a problem which many undertook to solve! There have consequently been introduced a large number of more or less ingenious devices, but as most of them have turned out to be impracticable, only two or three have ever met with general adoption. In France, preference is still given in many large works to the system adopted by Kuhlmann, of Lille, of driving the gases through a series of earthenware jars, where they encounter and are absorbed by a swift stream of cooled water running in an opposite direction. In England, the far more practical condensing towers, first suggested by Gossage, but much improved by the exigencies of modern progress, are still universally preferred, and, disregarding all other plans, these are what we shall now proceed to examine. If we were asked to make a rough-and-ready drawing upon the board, we should show these towers as exceedingly tall, square constructions, generally grouped in sets. They are packed with coke, and a fine rain of water falls down within them without intermission from a cistern placed upon their summit. The gases entering at the bottom are almost entirely absorbed by this water during their ascent, if they are tolerably rich and pure. If, on the contrary, they are very dilute and heterogeneous in composition, their absorption is less perfect, and instead of being allowed to pass off into the air when they reach the top, they are brought to the bottom of, and made to ascend, a second tower standing beside the first, where their condensation is completed.

(TO BE CONTINUED.)

A New Antimony Mordant.—M. A. Frey, in the Soc. Ind. Mulhouse, says that this salt has the formula $SbF_3 (NH_4)_2 SO_4$, and when mixed with half its weight of soda crystals is a fixing agent of better quality than tartar emetic, and is much cheaper.

Cold-Short Iron for Stoves.—The United States Consul at Malaga, Spain, tells a significant story about his experience in introducing American cook-stoves in that town, where he had found the only apparatus for baking to be a rude brick oven. The first American stove, shipped via Gibraltar, arrived at Malaga badly broken; but, after repairs (which cost as much as the original price), it was got into operation, and became the wonder and envy of all the Spanish cooks. As a consequence, two families ordered American stoves, with special directions for careful packing. But these arrived "all broken to pieces," and were a complete loss to the purchasers. Several other families, intending to send similar orders, but delaying in order to observe the result of those already sent, now despair of getting the much-desired articles, and decline to order and pay for stoves, only to receive scrap-iron. The consul says the packing was at fault; that each part should have been packed separately. We suspect that the iron may have been at fault also. Stove-plates are not famous for strength; but it ought not to be very difficult to make them so that they will not break in ordinary transportation. Some enterprising manufacturer should produce an article warranted to stand an ocean voyage, and then make a bold push for the Malaga trade.

BOOKS RECEIVED.

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

Skeleton Notes upon Inorganic Chemistry. Part I. Non-Metallic Elements. By P. de P. Ricketts, Ph.D., Professor of Assaying in the School of Mines, Columbia College, New York City, and S. H. Russell, E.M. Published by John Wiley & Sons, New York City. 1888. Price, $1.50.

Bulletin of the New York State Museum of Natural History. Albany: Chas. Van Benthuysen & Sons. 66 pp. and Table of Contents. Illustrated.

Nineteenth Annual Report of the Canadian Department of Marine for the fiscal year ending June 30, 1886. By Geo. E. Foster, Minister of Marine and Fisheries. Ottawa: Maclean, Roger & Co. 251 pp., 64 pp. introduction, table of contents, index.

Report of the Nova Scotia Department of Mines for 1887. By Charles E. Church, Commissioner of Public Works and Mines. Halifax: Queen's Printer. 66 pp. and table of contents.

DIVIDENDS PAID BY MINING COMPANIES DURING APRIL AND FROM JANUARY 1st, 1888.

Name of Company.	Paid in April.	Since Jan. 1.	Name of Company	Paid in April.	Since Jan. 1.
Atlantic, Mich	.....	60,000	Mary Murphy, Colo	.....	35,000
Calumet & Hecla, Mich	.....	500,000	Montana Lt., Mont	165,000	330,000
Central, Mich	.....	40,000	Morning Star, Colo	.....	25,000
Colo. Cent., Colo.	13,750	27,500	N. Belle Isle, Nev	50,000	150,000
Cons. Cal. & Va., Nev	108,000	432,000	Ontario, Utah	75,000	300,000
Daly, Utah	.....	150,000	Osceola, Mich	.....	50,000
Dunkin, Colo	30,000	80,000	Parrott, Mont	.....	18,000
Eureka, Nev	12,500	62,500	Plymouth Cons., Cal	.....	80,000
Franklin, Mich	.....	40,000	Quicksilver, Cal., Pref	86,000	86,000
Golconda, Idaho	60,000	120,000	Quincy, Mich	.....	160,000
Granite Mountain, Mont	200,000	800,000	Sierra Buttes, Cal	15,312	15,312
Homestake, Dak	25,0 0	100,000	Standard, Cal	5,000	35,000
Hope, Mont	25,000	50,000	Swansea, Colo	1,500	3,000
Idaho, Cal	23,250	93,000	Tamarack, Mich	120,000	120,000
Iron Silver, Colo	.....	100,000			
Jay Gould, Mont	36,000	112,000	Total	1,051,312	4,184,312
Mammoth, Utah	.. ..	10,000			

THE METALLURGY OF STEEL.*

By Henry M. Howe.

(*Continued from page* 309.)

Washed pig, *i. e.* cast-iron whose silicon has been very rapidly removed by iron oxide in a reverberatory furnace, effervesces very energetically as it runs from the furnace. This may be due to the sudden fall of solvent power through the removal of silicon. It may, however, be due to the retention of suspended particles of iron ore, which would energetically attack the carbon of the washed metal, with evolution of carbonic oxide.

C. Though the addition of a relatively small quantity of silicon and manganese to boiling, oxygenated, blowhole-forming metal completely arrests the escape of gas, yet hot-blown, unrecarburized, oxygenated, acid Bessemer metal may evolve an abundance of gas, chiefly hydrogen and nitrogen, before and during setting, and may rise very rapidly in spite of holding 1% of silicon: molten grey cast-iron, too, may evolve hydrogen and carbonic oxide copiously and sometimes rises in setting,[a] in spite of its high proportion of silicon. I cannot reconcile these facts with the belief that reaction is the sole cause of the escape of gas. For if the addition of 0·318% of silicon and 1·487% of manganese can completely arrest the oxidation of carbon in oxygenated iron, and if that of ·355% of silicon and ·073% of manganese can so far check it that the metal is perfectly quiet and rises but little (2 and 4, Table 70 A); then surely the presence of 1% of silicon should restrain it enough to prevent extremely rapid rising, and far more should the 1 to 3% of silicon in grey iron prevent it at the relatively low temperature at which this variety of iron sets; for the ratio of the affinity of silicon for oxygen to that of carbon appears to be much greater at low than at high temperatures.

But the phenomena readily agree with the solution theory. If silicon raises the solvent power, it should raise it for both solid and molten metal, so that the sudden fall of solvent power in solidifying should remain. Our hot-blown Bessemer metal,[b] retaining 1% of the silicon initially in the cast-iron, retains with it its high solvent power, and retains or takes up during the blow a correspondingly high proportion of gas. In setting, its solvent power like that of non-silicious metal suddenly falls, it is unable to retain the large quantity of gas within it, it evolves a portion, it rises violently.

So too our grey cast-iron, its solvent power perhaps increased a considerable while before its escape from the blast furnace by the acquisition of silicon, and thereafter exposed to nascent carbonic oxide, hydrogen, and perhaps nitrogen, may be conceived to become well saturated with these gases, a portion of which is subsequently evolved, their escape perhaps facilitated by the release of pressure, and by the agitation due to atmospheric oxidation of carbon. But our oxygenated metal, acid or basic, Bessemer or open-hearth, holds comparatively little gas, that initially present probably escaping during the converting process as, with the removal of silicon, the metal's solvent power diminishes. On solidifying, its solvent power further falls, and gas is evolved, and the more violently because, owing to its high freezing point, our oxygenated metal is the more suddenly solidified by the cold moulds. But the addition of even as little as 0·318% of silicon might well suffice to raise its solvent power enough to permit it to retain while setting the comparatively small quantity of gas which it contains when molten. Be it remembered that the quantity of gas evolved in setting, which according to Müller is something over three volumes in case of wild oxygenated metal, is probably but a small proportion of that which it still retains in solution. 11 volumes have been extracted on boring and 22 volumes of hydrogen have been absorbed by direct measurement. A comparatively small change of solvent power, then, might well determine the retention or expulsion of enough gas to convert a compact into a spongy metal.

In brief, the fact which appears to be general, that though the presence of silicon does not necessarily prevent the escape of gas, its addition temporarily arrests it, harmonizes so completely with the solution theory that it could be deduced from it, but is diametrically opposed to the belief that the oxidation of carbon is the exclusive cause of blowholes.

Does silicon act by reducing iron oxide? In the Mitis process rising, gas-generating, oxygenated metal is rendered perfectly tranquil by the addition of ferro-aluminium sufficient to introduce 0·06% of aluminium. As the aluminium appears to be wholly oxidized, so that none of it remains in the metal, it can hardly directly raise the solvent power: its direct influence can hardly survive its departure. Nor is it probable that it acts by preventing the oxidation of carbon, for the metal itself is practically carbonless. But may it not be that the presence of oxygen diminishes the solubility of gas in iron, and that the aluminium, by removing this oxygen, indirectly raises the solvent power? Silicon sometimes produces similar effects under like conditions: may it not act in this same indirect way?

Of course in many cases gas is evolved when iron oxide can hardly be present: in others the silicon added is apparently not oxidized: so that this mode of action can hardly be regarded as the prevalent one. It is striking, however, that several important classes of rising metal do contain iron oxide, *e. g.* oxygenated metal and much of the hot-blown rising Bessemer steel, in which the presence of oxygen is indicated even when it retains as much as 0·6 of silicon. (§ 159, p. 94.)

§ 216. GASES ESCAPE AND BLOWHOLES FORM WHEN GAS-FORMING REACTIONS ARE IMPROBABLE.—At the beginning of the after-blow of the basic Bessemer process only about 0·04% of carbon remains in the metal. The enormous quantity of air introduced during the remaining four minutes or so oxidizes this carbon but slowly, and it remains nearly constant at about ·04%: it has nearly reached a minimum. We teem without recarburizing, and our metal evolves thrice its own volume of gas, and becomes more porous than any other variety of iron.[c] Even if ignorant of the composition of the gas now evolved, it would be hard to believe that this was wholly an escape of carbonic oxide from a suddenly invigorated reaction: for the escape of three volumes of carbonic oxide implies the removal of ·02% of carbon, and it certainly seems most improbable that the small proportion of oxygen which molten iron can contain could rapidly remove half of that persistent residuum of carbon which had defied the great excess

[a] An explanation of its usual freedom from blowholes is attempted in § 201 D.

[b] If as Walrand holds the escape of gas from hot-blown Bessemer steel be due to a reaction between its carbon and the oxygen of the coating of iron oxide on the interior of the mould, the bearing of the phenomenon on the rationale of silicon's action remains unchanged. It still opposes the view that, when silicon does prevent the escape of gas, it does so by preventing reaction, for here this reaction occurs in spite of the abundant silicon: and it still harmonizes with the view that silicon acts by raising the solvent power.

[c] Müller, Stahl und Eisen, IV., p. 75, 1884; Iron, Feb. 15, 1884, p. 138.

of air and the basic slags of the afterblow, especially as the falling temperature probably constantly lowers the relative affinity of carbon for oxygen as compared with that of iron.

Turning from oxygenated metal, in which gas-forming reaction is improbable from lack of carbon, to cast-iron in which it is improbable from lack of oxygen, we have seen that rising and blowholes occasionally occur, even when considerable silicon is present, as in grey iron: when silicon is absent, as in white iron, blowholes are common (Table 71). That during solidification a reaction between carbon and oxygen should generate carbonic oxide and thus liberate gas, would imply that this cast-iron, rich in carbon and silicon, contains oxygen which up to the time of solidification remains uncombined with these elements: (if combined with silicon the resulting silica should rise to the surface by gravity). This in itself is improbable. That the carbon and oxygen which have remained uncombined up to the time of solidification should then combine is improbable, because the falling temperature should constantly diminish the relative affinity of carbon for oxygen.

The formation of blowholes when gas-forming reaction is improbable is further discussed in § 214, B and § 215, A.

§ 217. RATIONALE OF CERTAIN VARIATIONS IN THE COMPOSITION OF THE GASES.

The variations which I now attempt to explain are detailed in § 207 E, and illustrated in figure 14.

A. We have seen that, when cast-iron and the intermediate and final products of the Bessemer process are isolated and allowed to solidify in iron moulds, the proportion of carbonic oxide in the gases which they then evolve is greater the more highly carburetted they are. For reasons just detailed this opposes the belief that this carbonic oxide is generated at the instant of solidification by reaction between the carbon and oxygen contained within the metal: for, the more carbon the metal holds the more rapidly and completely should any oxygen present be eliminated, and the less should remain to cause a protracted escape of carbonic oxide in the moulds. But, on the solution theory, we may suppose that the changing composition of the metal changes the relative solubility of the different gases, and thus alters the proportion of carbonic oxide to hydrogen evolved in the moulds. The relatively high proportion of carbonic oxide in the mould gases of highly carburetted iron may be partly due to superficial oxidation by the atmosphere, the surfaces of the moulds, etc.

The high proportion of carbonic oxide in the spiegel-reaction gases and its continuous decrease as the metal solidifies and cools accord well however with the reaction theory, since the reaction should very rapidly decrease. But it accords at least as well with the solution theory. The more highly supersaturated a solvent, the more violently should it expel the dissolved substance, and the more marked should be the decline in the rate at which it evolves it. A bottle of soda water when first uncorked evolves gas tumultuously: the retardation, at first extremely conspicuous, can later be detected only by systematic observation. Now at the time of the spiegel reaction our metal should be only moderately supersaturated with hydrogen and nitrogen: hence the rate at which these gases escape should decline but slowly. The spiegel reaction, however, evolving nascent carbonic oxide so copiously within the metal, should greatly supersaturate it with this gas. Hence the decline in the rate at which it escapes should be more marked than in case of hydrogen and nitrogen, and hence the proportion of carbonic oxide to these gases should decline; and so it does.

B. The gases from molten metal, from solidifying metal, from the solid metal in the soaking pits, all contain much carbonic oxide: but when the metal has completely cooled and we bore it we find little or no carbonic oxide, nothing but hydrogen and nitrogen.[a] If we reheat it in vacuo carbonic oxide reappears. If we reheat it in a common furnace, and if by accident a blister forms on it, this blister contains much carbonic oxide. The absence of carbonic oxide from the boring gases may, however, be explained on either the reaction or solution theory.

On the solution theory the fact that the molten metal gives off carbonic oxide implies that it is supersaturated with this gas: as the solvent power should fall on solidification, carbonic oxide should still be given off: and that it is is shown by its presence in the soaking-pit gases. Why then is it not found in the blowholes on boring? We have seen, figure 15, that after solidification is complete the solvent power should rise with further fall of temperature. Now a large part of the gases set free during solidification probably works its way out at a somewhat lower temperature, through the hot porous metal. It is conceivable that the remaining carbonic oxide is reabsorbed by the metal: but that the solvent power for hydrogen and nitrogen does not rise enough with falling temperature to cause their complete reabsorption, so that they are found on boring.

On the reaction theory as well we should at first expect carbonic oxide in the boring gases, since this theory supposes that this gas is given off during solidification and forms the blowholes. The following explanation of its absence, which is here offered in its entirety for the first time so far as I know, applies to both the reaction and the solution theories.

We have seen in § 185 that at from about 300° to about 700° C. carbonic oxide is split up by iron very readily, the iron absorbing carbon and oxygen. At higher temperatures the tendency towards this reaction is very slight, and iron oxide then reacts readily on deposited carbon, regenerating carbonic oxide. Now the carbonic oxide given off by our white hot iron may be present in the soaking-pit gas and in the moulds gases, because the tendency to split it up is relatively slight at the high temperature at which these gases escape. But, as our iron cools our liberated carbonic oxide splits up while we are passing through the range of temperature, say 300° to 700°, favorable to its decomposition, and so none, or next to none, is found in our cold metal.

(TO BE CONTINUED.)

NOTE.—The publishers of the ENGINEERING AND MINING JOURNAL will thank the readers of this article if they wil promptly call attention to any inaccuracies they may observe in it.

[a] Müller (Iron, Sept, 14, 1883, p. 244), can find no explanation of the absence of carbonic oxide from the boring gases, but simply likens it to the fact, surprising to him, that silicon does not crystallize out along with graphite when cast-iron solidifies. But these two cases call for radically different explanations. We do not expect silicon to separate during solidification, because molten commercial irons are never saturated with it: solid iron is known to be capable of retaining far more silicon than molten commercial irons actually contain. (§ 63, p. 37.) We do expect carbon to separate out, because we know that molten iron often contains more carbon than solid iron is capable of retaining: and, if we regard carbonic oxide as dissolved in iron, we expect it too to separate on solidification, because its escape from the molten iron shows that the metal is supersaturated with it, and solidification should increase the supersaturation.

PERSONAL.

The Northwestern Coal Dealers' Association will meet at Milwaukee, Wis., on May 10 and 11.

The Western Coal Dealers' Association will hold its annual convention at Cleveland, O., on June 13th.

Mr. J. Langeloth, manager of the American Metal Company, Limited, of New York, has gone to Mexico on a tour of inspection.

Mr. R. B. Wallace has been appointed general manager of the Empire Mining Company, Marysville, Mont.

Mr. Charles Sellars has assumed the position of general superintendent for the Dittmar Mining Company, Joplin, Mo.

Mr. Frank Nicholson, mining engineer, has been appointed assayer in charge of the government assay office in St. Louis, Mo.

Mr. J. D. Groesbeck, who has until recently been at Corralitos, Mexico, has been engaged by the Mexican Ore Company, at El Paso, Tex.

Mr. John J. Vinton, manager of the foundry of Brown, Bonnell & Co., at Youngstown, for a number of years, has resigned, and will locate in Findlay, Ohio.

Mr. B. C. Luther, Chief Engineer of the Philadelphia & Reading Coal and Iron Company of Pennsylvania, has succeeded Mr. S. B. Wniting as General Superintendent.

Prof. M. E. Wadsworth, Principal of the Michigan Mining School at Houghton, Mich., has been appointed State Geologist for Michigan for one year. He takes the place of the late State Geologist, Charles E. Wright.

Mr. J. B. Mackintosh has resigned his position as Instructor of Chemistry at Lehigh University, South Bethlehem, Pa., and has been engaged as chemist by the Consolidated Gas Company, New York City.

Mr. William Ireland, Jr., State Mineralogist of California, is at present on a tour through Southern California, accompanied by assistants, to investigate the petroleum fields and building stone quarries.

Mr. Edward Bates Dorsey, Civil Engineer, who has been examining the Louisville & Nashville and New York, Lake Erie & Western railroads for English and German capitalists, was called to England unexpectedly and sailed April 28th.

Mr. P. F. Brendlinger, Chief Engineer of the P. S. V., has resigned that position and goes with Messrs. Brown, Howard & Co., Tarrytown, N. Y., contractors on the Croton aqueduct, as Chief Engineer. Mr. Wm. H. McQuail has been appointed General Manager for the firm.

Mr. Austin Corbin, President of the Philadelphia & Reading Company, sails to-day on La Champagne for Europe. Mr. Corbin will remain in Paris a week or more before he goes to London to make arrangements for floating the new 4 per cent bonds. He will be in New York again about June 15th.

Mr. Robert M. Hazletine, Chief Mine Inspector of Ohio, has appointed the following Assistant Mine Inspectors, who enter upon their duties May 1, each to serve three years: First district, Daniel J. Harry, of Jackson County; Second, David Evans, of Meigs; Third, James W. Haughwer, of Athens; Fourth, Captain Joseph L. Morris, of Coshocton; Fifth, Robert Bell, of Stark.

The *Progressive Age and Water Gas Journal*, which has hitherto been conducted in Philadelphia as a monthly publication devoted to the gas interests of the country, with May 1st becomes a semi-monthly, published in New York City. Mr. E. C. Brown, who for the past two years and a half has been the editor as well as owner of a large interest in the paper, has acquired control of the paper. The editorial management will be in the hands of Mr. F. R. Sprague.

Mr. Coleman Sellers, for over 32 years connected with the engineering establishment of William Sellers & Co., of Philadelphia, Pa., as engineer and member of the firm, has been ill for several years, and we learn, has recently been restored to health, through a surgical operation performed by the late Dr. D. H. Agnew. He has, however, retired from his former position, and accepted the chair of Engineering Practice in the Stevens Institute of Technology, at Hoboken. The Stevens Institute has also conferred upon him the title of Doctor of Engineering.

Mr. George H. Potts, of New York, died at his country place in Somerville, N. J., on April 28th. In early life he went to Pottsville, Pa., entered into the coal business, and became one of the heaviest coal dealers of that place. He was the first man to mine coal in that region. In 1854 he came to New York and became the head of the New York branch of the coal firm of Lewis Audenreid & Co. He continued at the head of this house for 20 years, and in 1874 be retired from business. He was succeeded by the firm of Frederic A. Potts & Co. Mr. Potts was one of the original incorporators of the Park National Bank about 30 years ago. During the last eight years he was president of the bank.

The fifty-first meeting of the American Institute of Mining Engineers, as already announced in a previous issue of the JOURNAL, will be held at Birmingham, Alabama, beginning on Tuesday, May 15th; but in order to gain time for the numerous excursions proposed, the first session will be held on Tuesday morning at 10 o'clock, instead of Tuesday evening as announced. Members are therefore urged to reach Birmingham by Monday evening. Members who desire to attend both the meeting of the Society of Mechanical Engineers, at Nashville, and the meeting of the Institute at Birmingham, are informed that the certificates issued for the former meeting will be honored for return trip from Nashville until May 25th, thus permitting the Birmingham meeting to be included; also, that an excursion rate, on the "certificate plan," will be made from Nashville to Birmingham and return.

FURNACE, MILL, AND FACTORY.

The Wetherald & Brown Wire Nail Works, Findlay, Ohio, started April 30th. It is stated that this is the first nail factory to start up in the Ohio gas field.

The Aurora Iron Company, of Aurora, Ind., manufacturers of fine sheet iron, has added another sheet mill to its plant, which is now in operation. The capacity has been doubled and the force increased.

The Western Steel Company, which has been operating the Vulcan Steel Mills in South St. Louis, Mo., will close in July. This is regarded as a result of an over-production in steel, decline in prices and scarcity of the right kind of ore in that market. The shut-down willl be permanent.

The Ingersoll Rock Drill Company, of New York, has shipped to the International Exhibition, Barcelona, Spain, a line of mining machinery, with catalogues and circulars printed in English, French and Spanish languages. The exhibition opens early in May, and will continue about six months.

The citizens of Latrobe, Pa., have subscribed $18,000 of the bonus required to secure the location of the proposed steel-plant there, and a committee has been appointed to raise $5,000 more. The citizens will give the company 54 acres of land underlaid with coal and the water company will give free water.

New lead-works for the manufacture of lead pipe, sheet lead, solder, type lead, etc., are about to be established in San Francisco. It will be run by a joint-stock company, and it is expected that the works will be opened by August. For years the Selby Smelting-Works has had a monopoly of this business.

Mr. B. W. Keim, of Newport, Ky., is said to have patented in eight countries a new process for making fine steel castings from old scrap in a cupola furnace, and that the cost is about equal to that of iron castings. The process is used at Newport by the Addystone Pipe Works, and a company is being formed at Pittsburg, Pa., to use it.

Mr. H. W. Hartman, late President of the Hartman Steel Company, with a number of other capitalists, have formed the National Wire Mat Company, for the purpose of manufacturing wire mats and wire fence. The new works will be undoubtedly the largest concern of the kind in the United States, and will be erected at Beaver Falls, Pa.

New York capitalists have purchased the Olcott Iron-Works, in Albany, N. Y., for about $125,000. The capacity of the two furnaces is 30,000 tons a year. The furnaces have been idle for some years. The plant originally cost about $400,000, but the panic of 1873 coming quickly after the furnace was started bankrupted the company.

There has just been completed a plant at Brewsters, near New York City, for the manufacture of iron by the Conley process. This plant, built by the Ramill Carbureted Ore Company, who have acquired the right to use the process under a royalty, was started this week, the iron work having been made by the Delamater Iron Company.

Work is pushed vigorously in all the various departments of the Oregon Iron and Steel Company's works at Oswego, Oregon. Timbering of the new mine has been commenced, and it is expected that the work of taking out ore will be commenced shortly. The pipe foundry is approaching completion. The works will probably be in active operation by July 1st.

One of the four new furnaces erected at Ensley City, seven miles from Birmingham, Ala., by the Tennessee Coal, Iron, and Railroad Company is now running from 180 to 200 tons a day. The three other furnaces are of like capacity, and will be fired up within the month. It is stated that the largest iron furnace in the South up to this time has only had capacity for 110 tons.

The Sprague Electric Railway and Motor Company of New York is making arrangements for an electric road at Davenport, Iowa, to start with eight cars, each equipped with two motors. It will be about 3½ miles long. The plant will also include an outfit of stationary motors of an aggregate of 100 h. p. for miscellaneous uses. The Sprague Company has just shipped some electric motors to Japan.

The rolling mill of the Tamarock-Osceola Copper Manufacturing Company, of Dollar Bay, Mich., is being operated to its full capacity, rolling copper wire and sheets. The metal thus manufactured is shipped to the mill from the Hancock smelting works, where the Tamarock and Osceola copper is smelted. A considerable quantity of manufactured copper has already been shipped southward from Dollar Bay.

The Land and River Improvement Company, of West Superior, Wis., of which F. H. Weeks is president, have now 200 men at work getting the land ready for erection of a blast-furnace with a nominal capacity of 200 tons a day. Mr. W. F. Mattes, Chief Engineer of the Lackawanna Iron and Steel Company, of Scranton, Pa., is now drawing the plans, which for the present are to include a pipe foundry. The ultimate object of the company is to build a steel rail mill at Superior.

A fire broke out in the large frame building occupied by the offices at the Bessemer steel-works of the Colorado Coal and Iron Company, at Pueblo, Colo., on April 29th. The safe, a large one, fell into the cellar, and with it the more valuable journals and accounts; but there were many others not in the safe, which were burned, together with architectural draughts and designs, maps and plats of the company's property in all parts of the State, and the valuable apparatus in the chemical laboratory.

A company has been organized in Birmingham, Ala., with a capital stock of $1,000,000, to operate a new process of steel making from phosphorus iron ore. The process is the invention of Prof. N. A. Pratt, State Geologist of Georgia. A cheap and simple chemical preparation is injected into the blowpipes of a blast-furnace and every trace of phosphorus is forced out with the slag, and the iron is converted into Bessemer pig at an extra cost of only 20 cents per ton. It is stated the process has been successfully tested.

The strike at the Edgar Thomson Steel-Works at Braddock, Pa., was declared off on the 3d inst. by District Master Workman Doyle, of the Knights of Labor. Rails were made in the new mill for the first time on the 2d inst. At 10 minutes before 12 M. a billet was introduced into the continuous rolls of the new rail mill and a steel rail turned out amid wild excitement. The first rail was not perfect, but after it others were rolled with ease. All the machinery worked smoothly. The blooming mill also made sheets on the same day, and on Tuesday night furnace E was unbanked, making four furnaces in operation.

The Eagle Machine Company, of Lancaster, Ohio, has adopted the process of A. A. Phillips, of Toledo, Ohio, for melting pig-iron in a cupola with natural gas. In the trial melting a bed of seven baskets of coke was put in the cupola, on top of which was placed 3200 pounds of iron, then two baskets of coke (a shovelful to each 400 pounds of iron) to the next 1200 pounds of iron, then two baskets of coke to 1400 pounds of iron (one basketful to each 700 pounds of iron). In the old practice a bed of seven baskets of coke was covered by 400 pounds of iron (one eighth of the first charge by the natural gas process), then a basketful of coke to each successive 400 pounds of iron.

The Gates Iron-Works, of Chicago, Ill., is making for the Cambria Iron Company, of Johnstown, Pa., the largest rock breaker ever made. This machine will be called the Mastodon or No. 8. It is of the same pattern as the other rock breakers built by the Gates Iron-Works, being simply larger in dimensions. Three openings will be provided for the admission of rock, each of which will be 18 inches by 18 inches by 45 inches. The capacity of the machine will be 125 tons of rock per hour. It will be used for crushing flux for the Cambria Iron Company's blast-furnaces. The weight of the machine will be about 35 tons, and it will require about 125 horse-power to operate it satisfactorily. The large castings for this breaker have been made by the Bouton Foundry Company, of Chicago, one of them weighing 12 tons.

The application of Benjamin Atha, one of the partners in the Newark Steel Works, Newark, N. J., for a receiver to wind up the business of the firm in consequence of irreconcilable differences between Mr. Atha and his partner, John Illingworth, has resulted in an understanding between the partners. Mr. Atha has agreed to purchase Mr. Illingworth's interest in the works for $287,500. The application was based on the grounds that as a business and social difference exists between Mr. Atha and John Illingsworth, the former found it impossible to conduct the business of the firm with profit or pleasure. It was declared that the assets over all liabilities were several hundred thousand dollars. The partnership has existed for ten years. The disagreement arose over a year ago over the patent for making solid steel ingots. The process is claimed by Atha and Illingsworth separately as patentees and by others, each claiming the priority of invention. No decision has yet been reached in the courts.

At a meeting of the Henderson Steel and Manufacturing Company held at Birmingham, Ala., on April 28th, for the purpose of deciding the question of increasing the capital stock, Messrs. J. S. Howell J. W. Bush, C. G. Brown, Gaylord B. Clark, of Mobile; the President, H. T. Groom, of Lexington, Ky., and the Secretary, H. F. Wilson, with Col. J. A. Montgomery as chairman, were appointed a committee to formulate plans for so increasing the capital stock, and the details of the new plant, and were instructed to report at the next meeting, which will be held on May 18th. It was decided to increase the capital stock to $1,000,000, and erect as soon as possible a large plant for steel making. In the meantime the present plant will be kept in active operation. The company, it is stated, will locate its new plant wherever the best inducements are offered.

CONTRACTING NOTES.

Machinery and supplies wanted. See page xiv.

Contracts open will be found on page xix. New contracts this week: No. 872, Sewers; No 873, Cast-Iron Pipe; No. 874, Sewerage; No. 875, Bridges; No. 876, Gas; No. 877, Bridge; No. 878, Electric Light Plant; No. 879, Building Water Tower.

GENERAL MINING NEWS.

NORTHERN PACIFIC RAILROAD.—The great tunnel through the Cascade Mountains on the Northern Pacific road, at 12:30 P.M., Pacific time, became an accomplished fact on May 3d. The formal opening of this great work will be about the 1st of June, after which it is expected that trains will run through regularly, and the temporary road over the mountains via the Switchback will be forever abandoned. The contract for building this tunnel was let to Wilson Bennett, who built a large part of the Northern Pacific Railway, including the Switchback, and work was begun in the middle of April, 1886. The material and machinery had to be hauled in wagons a distance of 90 miles, over a rough country with hardly a road, and some of the heavy machinery was moved by block and tackle the whole distance, and $125,000 had been expended before the actual work began. Men were scarce, but the contractor procured them from all parts of the Union and from Europe, but until the Cascade Division was finished he had difficulty in keeping the work moving.

The tunnel is 9850 feet long and 16 feet wide by 20½ feet high in the clear, and is intended for a single track road. The west end approach consisted of open cut through trap rock, while the east end enters the tunnel by crossing a creek immediately under a cataract, which has a fall of 160 feet Before crossing this creek the track is made by cutting a heavy ridge or slide of earth and loose rock. These two approaches contained in the aggregate upward of 30,000 cubic yards of material, most of which was solid rock, which had to be blasted. The strata or formations of the mountain lie nearly flat, having but a slight inclination from east to west across the entire range. By reason of this, the work was more dangerous and difficult than is experienced in most tunnels. The rock throughout was a gray conglomerate basalt, of medium hardness, but slacking and scaling on exposure to air, rendering timbering necessary.

The work has been constantly prosecuted from both ends since the first start was made, and the meeting of the two crews in the heart of the mountain took place to-day. The machinery used in constructing the tunnel was of the most approved kind and is in excellent order. The air compressors are one Ingersoll and one Clayton, the latter run by water power. The plant on the east end consists of four 70 horse-power steel boilers and two Ingersoll and one Clayton compressors, one Leffel water-wheel, one large double exhaust pan, one 45 horse-power engine, complete electric light plant, machine shop, blacksmith's shop, telephones, 15 Ingersoll Eclipse drills, 1 trimming drill, 1 locomotive of the H. K. Porter pattern, all the necessary cars, wheelbarrows and tools, stores, boarding-houses, stables, horses, etc. On the west end there is a duplicate of the east end plants, except the Clayton compressor. The tunnel is run without air shafts.

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—Official advices to us show that there were received during April from the mines of the Tracy City division only 12,753 tons of coal and 13,833 tons of coke, making a total from January 1st of 64,432 tons of coal and 53,724 tons of coke.

ARIZONA.

COCHISE COUNTY.

COPPER QUEEN MINING COMPANY.—It is stated that the company is going to construct a railroad from its copper mines at Bisbee, by way of Tombstone, to connect with the New Mexico & Arizona road at Fairbank, a distance of 35 miles.

ARKANSAS.

HOWARD COUNTY.

UNITED STATES ANTIMONY COMPANY.—This company is pushing work at its mines at Antimony City. One of the shafts has now a depth of 160 feet and is producing good ore. The smelters, crushers, etc., are in perfect order, and the company now contemplates puting up works for manufacturing the antimony products, at Antimony City.

CALIFORNIA.

MONO COUNTY.

BULWER CONSOLIDATED MINING COMPANY.—The chief work now being done by the company is tracing the disputed vein.

STANDARD CONSOLIDATED MINING COMPANY.—Official advices to us show that the report for March, just issued, shows balance on hand March 1st, $85,516.27; bullion product, bar 633, $7776.25; bar 634, $6156.47; sale of mine supplies to Bulwer Consolidated Mining Company, $43.59; total, $99,492.58. Dividend No. 72, $10,000; expenses, $13,705.33, total, $23,705.33. April 1st, balance cash on hand, $75,787.25.

PLUMAS COUNTY.

SIERRA BUTTES GOLD MINING COMPANY.—The thirty-sixth ordinary general meeting of this company was recently held in London. The report shows a net profit for the year of £5,175 4s. 1d. The company has had this year an addition to the ordinary expenditure in the building of a new mill at a cost of £628, and repairing the water flume at a cost of £735, both of which have been paid for out of revenue. A considerable reduction has been made in the cost of working the mines. The yield of gold shows a falling off in value of $1 per ton, and at present is only $3.02 per ton. The company has bonded another property for four months

YUBA COUNTY.

GOLDEN GATE.—A lease of a portion of this hydraulic mine at Smartsville has been made to Gideon Frisbee, of the firm of the Frisbee-Lucop Mill Company of New York.

CANADA.

PROVINCE OF NEWFOUNDLAND.

TILT COVE COPPER COMPANY, LIMITED.—This company has been organized, with a capital stock of £160,000, shares £2 each, to lease or purchase of mining properties at Tilt Cove, Newfoundland, granted to the vendors by the trustees of the estate of the late Charles Fox Bennett, of June 24th, 1886, and made between Thomas Reynolds Smith, Charles Thomas Bennett, and Arthur James Williams Bennett of the one part and John Taylor of the other part.

PROVINCE OF ONTARIO.

KINGSTON & PEMBROKE IRON MINING COMPANY.—The company has shipped its first cargo of ore since navigation opened, consigned to one of the largest consumers of ore in Pittsburg. If the ore is satisfactory, they agree to take all the product of the Wilber mine.

RICHARDSON.—Official advices to us show that there is a little good rock in the old shaft at this mine near Eldorado, near the place where the rich pocket was struck, but there is no vein or regular formation. Some 60 feet in a southeasterly direction a new shaft was started, which is about 18 feet wide at the top, 26 feet deep and 6 feet wide at the bottom. There is an apparent hanging-wall of granite, under which there is a layer of hard hornblende rock, with thin streaks of quartz dipping about 78 degrees. What appears to be a foot wall of talcose slate dips at an angle of 70 degrees, with a small leader of the same rock as under the banging. Between the leaders there is a talcose horse. It is thought that by going 6 or 8 feet deeper the two leaders will meet and run out. Every body else, and particularly the interested parties, think it will form a vien. This distant vein or leader runs northwest and southeast, whereas the old vein runs nearly north and south. They are stamping some good rock there is no doubt, but as there is no work done ahead, no estimate of quantities can be made.

COLORADO.

BOULDER COUNTY.

KEYSTONE.—The sale of this mine of Magnolia to Eastern capitalists is reported.

POORMAN.—It is reported that this mine at Caribou has been sold to a syndicate headed by Governor Tabor for $350,000.

GARFIELD COUNTY.

Mr. John McNeil, State Inspector of Coal Mines, has recently visited the coal-fields about Glenwood Springs. He examined particularly the collieries of the Midland Railway Company. This company has control of a vast acreage of productive coal lands in the district known as Jerome Park, eighteen miles south of Glenwood, and at an elevation of about 2000 feet above that town. There are three fine productive seams in these strata, varying in the character of the coal produced, but all yielding desirable fuel.

The principal mine is the Sunshine, and although of comparative recent development it is employing 75 to 125 men, and producing 500 to 750 tons of marketable coal a day. The product of the mine finds a ready sale at Aspen, Leadville and other points, the coal ranking equal to the best in Colorado for domestic purposes.

A great deal of new work is in progress at the Sunshine, notable among which is the starting of a new slope, the completion of which will place the mine in position to produce at least 1,000 tons daily. The vein has a thickness of 7 feet and dips at an angle of 45 degrees.

Another vein in the same zone is opened by the Marion mine. It shows a six-foot vein of coking coal. The product of this property is largely utilized in the manufacture of coke, fifty Welsh drag-ovens being employed in the industry, and yielding about seventy tons of coke daily. These ovens are situated at Cardiff, three miles below Glenwood Springs.

Another vein of desirable coal is opened in the Spring Gulch mine. This seam yields a superior blacksmith and steaming coal. It, like the other, is six feet in thickness and will, with proper development, make a very large producer. In a very short time the properties of the Denver & Rio Grande near Carbondale and those of private parties will be added to the list of regular producers.

LAKE COUNTY.

Only nine furnaces are in blast at the Leadville smelters at present. This is the lowest number on record since 1879, and is unusual. It is more than probable that additional furnaces will be blown in shortly.

HIGHLAND CHIEF GOLD AND SILVER MINING COMPANY.—This company has been organized with a capital stock of $250,000. The incorporators are George W. Trimble, J. B. Grant, Horace Steele, F. G. White and George C. Steele. The principal office will be at Leadville.

IRON SILVER MINING COMPANY.—The company has begun to use crude petroleum under the boilers at the concentrator.

LILIAN MINING COMPANY.—The superintendent estimates the total product for April at over $10,000, including the smelting ore extracted.

PARK COUNTY.

The sale of the Beaver Creek placers, near Fairplay, embracing about 850 acres of patented ground, to Michigan and London parties is reported.

PITKIN COUNTY.

During the week ended April 27th the total shipments amounted to 2120 tons, of which Denver got 1428 tons; Leadville, 427 tons; and Pueblo, 265 tons.

In the State Supreme Court at Denver, on April 27th, the case of Atkinson against Tabor was decided in favor of ex-Senator Tabor.

The case, in addition to involving a large sum of money, presents some interesting features, says the Denver *Tribune-Republican*. Six or seven years ago ex-Senator Tabor bonded the Tam O'Shanter mine, situated at Ashcroft, in Pitkin County, for the sum of $100,000. A number of men were at once put to work on the property, and the vein opened up very satisfactorily and extending promises of making a great mine. When it was learned that the bond would likely be taken up, Mr. S. E. Bruckman, a mining operator, served notice on ex-Senator Tabor to the effect that he held an interest in the propeoty, although it was not on record, and cautioned the contemplating purchaser against paying the money to the Atkinson Brothers, who discovered and located the mine, and had placed a deed, made out to Tabor, in a Leadville bank. Inquiry regarding the interest of Mr. Bruckman showed that for a time he had "grub-staked" the Atkinson boys—expending several hundred dollars in the purchase of supplies and tools. The Atkinson boys admitted this claim, but declared that Mr. Bruckman, long before the discovery of this vein, had ceased to contribute to the expenses encountered in prospecting and had declared himself out, both by word of mouth and by his refusal to respond to further demands for money. Ex-Senator Tabor being desirous to acquire title to the property, and wishing to obviate possible further litigation, notified both parties that at a specified time he would be at the bank, deliver over the money and demand the deed. The instant the transaction between Tabor and the bank was consummated, and before the Atkinsons could get their check cashed, an injunction was served on the bank officials, restraining them from paying over the money. The injunction prevailed for some time, and before the disposition of the case the bank failed and neither party received any of the contested money. The Atkinson Brothers assumed the position that, having never received any money for their mine, it still belonged to them, and brought suit to recover possession. This claim was denied in the District Court of Lake County. The decision of that court was yesterday affirmed by the Supreme Court.

DURANT VS. ASPEN.—The Apex side line case which has been in the courts for nearly two years was compromised last week. According to the local papers the agreement shows that Messrs. Brown and Butler agree to deed to Mr. D. M. Hyman, or of such persons as he may designate, a third interest, or one half of their two thirds interest. This will make the Durant a half owner in that part of the Aspen mine which is included in the end lines of the former extended. In the compromise which was commenced about four months ago, J. B. Wheeler, a one third of the Aspen and President of the Aspen Mining and Smelting Company, entered into an agreement by which he deeded his interest to a compromise company. Mr. Hyman, who represented the Durant, received one half of the stock of the company then formed. Thus the Durant owns one half of the interest of the three owners of the part of the Aspen in dispute. The Durant, by the agreement, also gets one third of all the dump ore which has been taken from the entire mining operations of the Aspen. Messrs. Brown and Butler have heretofore claimed that this dump contained much value, and the Durant people say that if this is true the valuation which they become owners of must be equal to one half of the dump ore which has been taken from the territory heretofore in dispute. The Durant also becomes a half owner of the shaft, machinery, tramways, ore-houses and all other property on the Aspen. This is very valuable, for the reason that if they had carried their case through the courts successfully they would have only gained title to the vein, and could not, it the Aspen owners had endeavored to prevent them, have worked it from the top, but would have been obliged to get in by tunnels or by following it downward. The Durant, finally, obtains the privilege of a right of way through the Aspen ground for all purposes ever made necessary by development to prove title to the vein in properties below. In consideration for these concessions the defendants, Messrs. Brown and Butler, receive $30,000, which amount is to be paid in monthly installments out of the proceeds of the mine. They each retain an undivided one sixth interest in the Aspen property, which now becomes, it may be said, absolutely theirs. They also get each one sixth of the money which is in the hands of the court, but which does not amount to much more than $14,000 at present. The Durant owners dismiss all suits, each party to pay their own costs. The contempt proceedings, of which voluminous testimony is before Judge Hallett, are, as far as the Durant owners are concerned, no longer to be pushed. Work on the Aspen is to commence at once, and not less than 200 men will be employed. It is expected that the first ore will be shipped shortly.

DAKOTA.

PENNINGTON COUNTY.

QUEEN BEE MINING COMPANY.—Operations on a large scale are about to begin. Shipments of concentrates will be made monthly to Omaha, each shipment comprising from fifty to sixty tons. The freight rate from the mine to Omaha will be about $11, giving a good margin for profit, if the ore comes up to expectations in value.

IDAHO.

ALTURAS COUNTY.

CAMAS NO. 2.—Messrs. Womble & Irwin, from San

Francisco, have examined this mine and mill in the interest of capitalists.

KING OF THE WEST MINING COMPANY.—The company has levied another assessment of 15 cents per share, aggregating $15,000. This will make the third assessment, aggregating $45,000, levied by this company within the past year. This last assessment is to pay for the concentrating works about to be erected by the company, and which are expected to be ready to run by July. The King of the West group is situated in Little Smoky Mining District. It has been thoroughly opened. A large amount of ore extracted while opening the mine is on the dump.

KENTUCKY.

Mr. C. J. Norwood gives the following figures of the coal production of Kentucky in 1887, in bushels of 80 pounds: Western district, 24,557,049; southeastern district, 15,008,467; northeastern district, 8 764,-114; total bushels, 48,329,630, or 1,933,185 net tons.

MEXICO.

Reports from the City of Mexico, dated April 20th, state that Mount Popocatapetl is throwing showers of ashes over the surrounding country, and fears of a decided volcanic eruption are entertained.

President Diaz, in a recent message to the Mexican Congress, says: Mining industries have progressed remarkably. According to the data up to the present received in the Department of Public Works, during the past five months, 859 denouncements of property have been registered, including 10 beneficiating works. The partial reports resultant from visits to the mines clearly set forth the progress attained in mining, while the new explorations made, and those under way, demonstrate that there is much yet to develop, not only in mines of silver, but also of iron, copper, gold, and coal.

The law of June 6th last, authorizing the executive to negotiate contracts under certain conditions, and with certain guarantees, has produced excellent results. Under that law 36 contracts have been made for the development of mining properties in the States of Mexico, Puebla, Guerrero, Michoacan, Queretaro, San Luis Potosi, Durango, Coahuila, Sinaloa, Chihuahua and lower California, it being noticeable that these works were conducted on new or abandoned mining properties. The guarantees offered by the concessionaires give promise that the contracts will be carried out, for up to the present they are complying with their obligations, while some of them have organized companies abroad and secured capital for their undertakings. As one of the obligations they assume is the deposit by them within a specified period of a certain sum, it is safe to suppose that with those contracts and the five approved by Congress before the passage of the law, all of like intent, the sum at least of $14,000,000 will be invested in mining operations.

MONTANA.

DEER LODGE COUNTY.

BI-METALLIC MINING COMPANY.—The new machinery for the hoisting works has been received. It consists of two 1200-pound boilers, attached to which are self-condensing, patent conducting engines, which are to be used for the purpose of giving additional hoisting power.

CABLE MINING COMPANY.—The suit against this company, to which we referred in our last issue, will probably not be settled for some time. The defendants have filed a notice of appeal.

GRANITE MOUNTAIN MINING COMPANY.—The company has decided to reduce dividends for the next four months one half, to 25 cents a month. This is done for the purpose of securing a fund for building the new mill.

JEFFERSON COUNTY.

A correspondent writes us from Basin that some development work is being done on quartz prospects there, though not as much as should be. The camp is about eight years old, and with few exceptions the 400 or more claims in this district have no development work on them. The owners have been waiting for a railroad, and now the Northern Pacific Railroad has been running trains here for four months, and not two car loads of ore have been shipped. Another line, the Montana Central Railroad, expects to have trains running between Helena and Butte by July, which will give the camp all it could ask in the way of transportation. Fifty samples, taken from the most promising locations last fall, gave an average of 12 ounces of silver for surface ore. Quite a number of locations carry a fair percentage of gold, copper and lead.

The Pennsylvania Placer Company, J. T. Walsh, Superintendent, has resumed work on Jack and Basin creeks with a force of about 25 men.

LONE STAR.—This mine, located in the Cataract district, has been bonded by C. W. Honacker, for himself and others, for twelve months from May 26th, for $25,000. The parties who have bonded the property propose to put in a mill at once, and to push development work as fast as possible.

MISSOULA COUNTY.

MONTANA PLACER MINING COMPANY.—This company has been organized at Salt Lake City, where the principal office will be, with a capital stock of $2,-000,000, shares $10 each, assessible, but not to exceed ten cents per share. The company owns the Montana Placer Mining claim, containing 160 acres of placer mining ground, situated in Missoula County. The officers are: Phillip Pugsley, President; Henry Rudy, Vice-President; Joseph A. Jennings, Treasurer; David McKenzie, Secretary.

NEVADA

LINCOLN COUNTY.

PIOCHE MINING COMPANY, LIMITED.—This company has been organized in London with a capital stock of £250,000, shares £1 each, to purchase mining property within the Ely mining district, and to carry on the business of a mining, smelting, and trading company in all its branches.

STOREY COUNTY—COMSTOCK LODE.

The Virginia City *Chronicle* reports the following:

CONFIDENCE MINING COMPANY.—The total shipments up to April 25th aggregated $122,401.35 for that month.

GOULD & CURRY MINING COMPANY.—Sshipments of ore have been made to the Douglass mill in Gold Hill. The mill has but 10 stamps with a maximum crushing capacity of about 30 tons per day of 24 hours. The grade of the ore is above what is termed "milling," and if the test run is satisfactory shipments of 40 tons will be made daily from the mine. There is a large quantity of ore extracted in the ore bins and in drifts in the mine, and an extensive area is also stripped in the upper workings awaiting extraction.

WHITE PINE COUNTY.

NEW EBERHARDT COMPANY, LIMITED.—This company has been organized in London with a capital stock of £75,000, divided into 250,000 ordinary and 50.000 preference shares of 5s. each, with power to increase or reduce such capital, and to issue any part or parts of the original or increased capital, either at a discount, at par, or at a premium, and with such preferential rights to dividend or priority in the distribution of assets, and subject to such postponement of dividend or share in the distribution of the assets as the company shall determine upon. The object of the company is to acquire from the Eberhardt and Monitor Company, Limited, the mines and all other property and assets of that company whatsoever, and to enter into any agreement or agreements for that purpose; to purchase, lease, or otherwise acquire lands. The Eberhardt and Monitor Company at Taylor is hauling ore to its mill and operations will soon begin.

OHIO.

COLUMBUS & HOCKING COAL AND IRON COMPANY.—The company issues a statement of gross and net earnings for the year ended March 31, 1888, as follows: Gross earnings, $1,320,558; operating expenses, $1,148,046; net earnings, $172,511. There are $1,000,000 6 per cent. bonds outstanding.

PENNSYLVANIA.

PHILADELPHIA & READING RAILROAD AND COAL AND IRON COMPANIES.—There are now on file in the County Clerk's office, at Trenton, N. J., four large mortgages of the Philadelphia & Reading Railroad Company and the Philadelphia & Reading Coal and Iron Company to the Pennsylvania Railroad Company for the insurance of lines and the granting of annuities. They cover the entire value of the Reading Company's property as far as the Bound Brook division is concerned. The four mortgages aggregate about $175,000,000 and are in accordance with the original plan of organizing the Reading Railroad as agreed upon by the trustees. The first mortgage was filed April 25th, and the others on April 26th, 27th, and 28th.

COAL.

MCCLURE COKE COMPANY.—This company has been organized to carry on operations in Fayette and Westmoreland counties. The capital stock is $1,000,000, and the stockholders are Gilbert T. Rafferty, Charles Donnelly, B. H. Ruhe, Wm. T. McTighe, of Pittsburg, and John P. Brennan, of Scottdale. This new company has been formed by the consolidation of the firms of McClure & Co., and Rafferty & Donnelly.

PHILADELPHIA & READING COAL AND IRON COMPANY.—This company will discontinue the erection of a new breaker at Preston No. 2 colliery, Girardville, and will construct instead a tunnel from Big Mine Run colliery to the workings, and bring the coal to the surface at that point. The Thomaston colliery, after having been idle since the first of the year, has resumed operations. Suit was begun in Shenandoah, April 28th, against this company for wages due the sheriff's posse for services rendered during the labor riots resulting from the recent coal miners' strike. The amount involved is about $3000.

SHANER GAS COAL COMPANY.—The company will build 300 coke-ovens in Possum Hollow, near Guffey Station.

NATURAL GAS.

PHILADELPHIA COMPANY.—The contract for natural gas for the Negley's Run pumping station, Pittsburg, has been awarded to this company for $40,000 per year. The price paid heretofore was $27,000. The same company received the contract for the Bedford avenue station at $5000 and for the Herron Hill station at $3000 per year.

OIL

Exports of refined, crude, and naphtha from the following ports, from January 1st to April 28th.

	1888. Gallons.	1887. Gallons.
From Boston	704,864	1,698,710
Philadelphia	34,305,419	38,688 645
Baltimore	965,514	1,895,689
Perth Amboy	6,896,487	4,730,342
New York	107,330,836	108,586,219
Total exports	150,203,120	155,599,605

TEXAS.

GRAND BELT COPPER COMPANY.—Mr. William Belden, the receiver, gives notice that all creditors are to deliver their respective accounts and demands to him at his office, Room 21, 48 Wall street, New York, by the 21st day of May. All persons holding any open or subsisting contract of this corporation are to present the same in writing and in detail by that date.

UTAH.

SAN PETE COUNTY.

We are officially advised that great excitement exists near Manti, the proposed terminus of the California Short Line Railroad, over the discovery of silver in the chloride state, and many claims are being located.

SUMMIT COUNTY.

ANCHOR MINING COMPANY.—Our correspondent writes us that the Anchor drain tunnel, with which it is proposed to drain the company's property, has been driven 3100 feet, out of a total of 6618 feet. Connection with the intermediate shaft, 296 feet deep, was made two weeks ago. This tunnel will also open up some of the most valuable properties in Utah, such as the Lady Morgan and Black Diamond group. It is hoped that connection with the Anchor shaft will be made by the 1st of July.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 4.

Statistics.

Production Anthracite Coal for week ended April 28th, and year from January 1st:

TONS OF 2240 LBS.	1888. Week.	1888. Year.	1887. Year.
P. & Read. RR. Co.	148,753	1,472,507	2,404,276
Cent. R. R. of N. J.	96,493	1,502,199	1,492,965
L. V. RR. Co.	102,024	1,640,948	2,287,646
D., L. & W. RR. Co.	95,875	2,169,197	1,679,227
D. & H. Canal Co.	68,724	1,455,234	1,272,793
Penna. RR.	64,878	1,350,516	987,200
Penna. Coal Co.	25,623	460 677	436,140
Tota	60',370	10,051,278	10,559,247
Increase			
Decrease	55,292	507,969	

* Report not received.

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

Production for corresponding period:

1883	9,174,165	1885	7,822,587
1884	8,610.380	1886	9,652,229

Production Bituminous Coal for week ended April 28th, and year from January 1st:

Tons of 2000 pounds, unless otherwise designated

EASTERN AND NORTHERN SHIPMENTS.

	1888. Week.	1888. Year.	1887. Year.
Phila. & Erie RR.	905	23.079	
*Cumberland, Md.	73,107	1,092,028	862,458
Barclay, Pa.	3,310	61,525	77,550
Broad Top, Pa.			
H. & Broad Top. RR.	4,783	135,393	137,870
Clearfield Region, Pa.			
Snow Shoe	1,883	49.547	61,330
Karthaus (Keating).	1,379	59,847	66,668
Tyrone & Clearfield.	74,320	1,184,764	1,045,409
Tipton	1,961	18,134	
Alleghany Region, Pa.			
Gallitzin & Mountain.	17,438	315,143	281,791
Pocahontas Flat Top Coal.			
Norf'k & West. RR.	25,365	515.793	383,656
Kanawha Region, W. Va.			
Ches. & Ohio RR.	31,843	610,523	498,130
Total	236,294	4,065,776	3,414,862

* Tons of 2240 lbs.

WESTERN SHIPMENTS.

Pittsburg Region, Pa.			
West Penn RR.	5,600	131,244	109,244
Southwest Penn. RR.	1,565	35,039	55,344
Pennsylvania RR.	4,771	94,406	81,652
Westmoreland Region, Pa.			
Pennsylvania RR.	44.817	572,284	526,429
Monongahela Region, Pa.			
Pennsylvania RR.	8,371	103,819	116,977
Total	65,124	936,792	889,646
Grand total	301.418	5,002,568	4,304.508

Production of Coke on line of Pennsylvania RR, for week ending April 28th, and year from January 1st, in tons of 2,000 pounds: Week, 74,953 tons; year, 1,255,147 tons; to corresponding date in 1887, 1,462,237 tons.

Anthracite.

There has been little or no change in the anthracite market during the week past. If possible, the New York market is duller than it was a week ago, but the Eastern market appears to be somewhat better. Prices remain as they were, and the companies are firmly holding to their circular rates; but the roads are filled with loaded cars, and the stocking places are piled up so that the business is much smaller than could be desired.

In the face of a declining iron market, it is evident to every one that the price of anthracite should have been made lower at the commencement of the year, but it is equally clear that having made a price the companies should stand by it, even though they sell little or no coal for the next few months. The production during the month of April was about 2¾ million tons, which was considerably more than the amount allotted. During the current month the output should be 2,400,000 tons. This amount is even more than prudence would dictate; and if it should be exceeded it will have a still further depressing effect upon the market.

We continue our quotations of last week as follows: Broken, $3.75; Egg, $4; Stove and Chestnut, $4.25; Pea, $3 to $3.30 for free burning coals, f.o.b. Actual prices obtained by individual operators or their agents may be quoted as follows: Broken and Egg, $3.50 and upward; Stove and Chestnut, $3.75 and upward; Pea, $2.70 to $2.90 and upward, f.o.b. for free burning coals.

The Lehigh Valley Railroad has made a through rate on coal from the mines to the furnaces by which the price at the furnaces is reduced somewhat. We are informed that this rate does not greatly exceed six tenths of a cent per ton-mile, and it appears to satisfy the furnaces. It leaves about $2.10 for the coal at the mines, which is as low as the producers can afford to sell. All the mines in the Lehigh region are put upon the same basis. Under this new arrangement they all pay the same freights whatever their distance from the furnaces may be. This is a benefit to the more distant mines, but it increases the freights of the nearby collieries.

Bituminous.

There is very little new this week in the bituminous trade. None of the large contracts, beyond that of the New York & New Haven Railroad, has been signed. As we stated last week, this New York & New Haven contract was at about $2.50 on board at shipping ports. It amounted to 170,000 tons, of which the Eureka gets about 80,000, Pocahontas about 60,000, Powell about 20,000, and Scott about 10,000 tons. The contract of about 30,000 tons for the Connecticut River road is also reported closed.

Prices remain nominally at $2.60, f.o.b. at shipping ports, but most of the current contracts are supposed to have bids of ten to fifteen cents less than nominal rates.

Boston. May 3.

[From our Special Correspondent.]

Increased activity from the eastern market may be expected now very shortly, as May Day has come and gone. The firmness of the market for anthracite coal continues unabated. The fact that the companies at their recent meeting decided to make no change in circular prices is evidence that they think they can hold their ground, notwithstanding prices are thus left 25 cents above the opening figures of last season. It is given out to the trade here that there will be sufficient restriction to keep the output down to such a point as will sustain the market, and that an understanding exists which will be as effectual as the agreements of former years.

At present the companies feel quite secure. Broken coal is especially strong, as it is scarce with all hands. Individual operators are shading circular rates ten to fifteen cents on other sizes, and some "off color" coal can be had at material concessions if anybody wants it, say 25 cents per ton below circular. There is but little inquiry for this coal, however. The scarcity of cars continues to hold the operations of individual shippers in check.

The former quotation of $2.50@$2.60 f.o.b. continues to rule nominally in the soft coal market. Delivered contracts are made on that basis. Transactions openly reported are few, the last being the Russell Paper Mills for about 10,000 tons.

Freight rates remain up, and outside quotations have been paid.

We quote, exclusive of discharging: New York, 75@80c.; Philadelphia, 95c.@$1.10; Baltimore, $1.10@$1.15; Newport News and Norfolk, 95c.@$1.10; Richmond, $1.15@$1.25.

The retail trade have again reduced prices 25 cents per ton, but rates are now, like f.o.b. rates, 25 cents above those of last season. The trade from retail standpoint is very light. We quote reduced prices as follows, 2000 pounds to the ton, delivered: Stove, $6; Egg, $5.75; Broken, $5.50; Nut, $6; Franklin, $7.25; Lehigh, Egg, $6.25; Broken, $6; Bituminous (on the wharf), $4.25.

Buffalo. May 3.

[From our Special Correspondent.]

The following are the retail rates for anthracite coal at Buffalo, per net ton delivered, commencing last Tuesday and to continue for one month: Grate and Egg, $4.50; Stove and Chestnut, $4.75; Pea, $3.75. Cannel and Brier Hill coal for parlor grates, $6 per net ton delivered. These figures show a reduction of 25c. from the rates of May, 1887, and $1 from the rates of April, 1888, per net ton. As the railroad freights from the mines to Buffalo are 30c. less this year than in 1887, it shows that the producer has advanced his price 5c. per ton. The Buffalo Coal Exchange rules say that when coal is sold at the yards, the price shall be 40c. per ton less than the delivered figures. Rates to steam yachts and canal boats shall be same on dock per ton as the regular established retail quotations. All coal shall be sold at the regular established retail prices, and these prices are for coal delivered during the month in which the order is taken only.

The date has been extended for the receipt of contracts for coal for the New York Central and West Shore railroads from May 1st to the 15th.

The principal topic of interest since my last letter was the opening of navigation at this port. The first propeller left at 9:30 A.M. April 28th (she is now in the ice at the Straits), and the next day four propellers arrived light from Cleveland, the first entering the harbor at 3 P.M. Subsequently 40 to 50 vessels have departed, and a few Detroit craft, grain laden, have arrived. The first vessel from Chicago started April 29th; she is with many others on the Michigan side of the Straits. The latest news from Mackinaw is that two propellers forced a passage through the South Channel yesterday, stern foremost, and that afterwards four propellers followed in their wake. They are all fast in the ice, and doubtful if they get through until weather warms up. Last night cloudy and cold; wind southeast.

The freight question is worthy of note. Many vessels have been chartered to arrive at rates mentioned elsewhere. There is a fair inquiry for more, although some shippers preferred to await the arrival of the Chicago fleet before contracting, as there might be a possibility of a break in rates. As a rule, however, forwarders considered it the best policy to secure vessels to arrive rather than await their coming and picking them up then.

The shipments of coal by lake from opening of navigation to May 2d inclusive, 59,259 net tons, namely, 39,847 to Chicago, 13,687 to Milwaukee, 3700 to Duluth, 840 to Sandusky, 800 to Racine, 9885 to Toledo, 500 to Bay City. The rates of freight were 75c. to Chicago, Milwaukee and Racine, 60c. to Duluth, 50c. to Toledo, Sandusky and Bay City.

The Erie, Champlain, Black River, Oswego and Cayuga and Seneca canals will be opened for navigation May 10th.

An immense amount of new tonnage has been added to the lake marine the past 12 months. Since the close of 1886, 115 vessels have been built (or nearly completed) at a cost of $12,000,000, and of 156,000 measurement.

Pittsburg. May 3.

[From our Special Correspondent.]

There have been no river shipments of coal since our last, the Ohio River being down to low water mark. All the boats that left on the late rise have returned with empties, and were forwarded to the pools to be loaded for the first rise. The wharf is crowded with tow boats. Market steady, without quotable changes. The rates are:

PRICE OF COAL PER 100 BUSHELS = 7600 LBS.

First pool	$4.75	Fourth pool	$3.25
Second pool	4.25	Railroad coal	5.00
Third pool	3.75		

The market of Connellsville coke remains in a very unsatisfactory condition. Prices low, in fact too low. So far dealers have failed to make a satisfactory arrangement in regard to prices. We quote altogether nominally:

Blast furnace f. o. b. cars at works, $1; to dealers, $1.10; Foundry, $1.25.

Freights.—New rates to Pittsburg, 80 cents per ton; Chicago, $3; Springfield and Urbana, Ohio, $2.75; Toledo, $2.90; Cincinnati, $2; Indianapolis, $2; all valley points, $1.50; East St. Louis, $3.50; St. Louis, $3.65. Other points same proportion.

FREIGHTS.

The latest actual charters to May 3d. per ton of 2240 pounds:

From New York to:—Bath, Me., .75*; Beverly, .75; Boston, .70*; Bridgeport, Conn., .50; Cambridge, Mass., .70*3c; Cambridgeport, .70*3c.; Charlestown, .70*; Chelsea, .70*; Com. Pt., Mass., .70*; E. Boston, .70*; E. Cambridge, .70*3c., E. Greenwich, R. I., .75; Fall River, 75; New Bedford, .80; Newburyport, 90*; New Haven, .50; New London, .70; Newport, .75; Norwalk, Conn., 55; Portsmouth, N. H., .85*; Providence, .75; Salem, .70@75*.

From Philadelphia to:—Boston, 1.05*; Charleston, .75@80; Charlestown, .90*; Chelsea, .90@1.00*; Com. Pt., Mass., .95@1.00*; East Cambridge, .95*; Fall River, .90@.95*; Gloucester, 1.10*; Lynn, 1.10@1.15*; Marblehead, 1.05*; Milton, 1.15*; New York, 90†; New Bedford, .90@.95*; Newburyport, 1.20*; Norfolk, .55; Portsmouth, N. H., 1.15*; Providence, .90@95*; Richmond, Va., .65; Salem, Mass., .1.05*; Savannah, .80; Washington, .85; Wilmington, N. C., .85@90.

From Baltimore to:—Bangor, Me., 1.15@1.20; Bath, 1.10@1.15; Boston, 1.10; Bridgeport, Conn., .95@1.00; Brooklyn, .90@95; Charleston, .80@1.00; Fall River, 1.00; Galveston, 3.00; New Bedford, .95; Newburyport, 1.30; New Haven, .95; New London, .95; New York, .90; Pawtucket, 1.10; Portland, 1.10; Portsmouth, N. H., 1.10@1.15; Providence, .95; Richmond, Va., .70; Salem, Mass., 1.10; Savannah, .75@.80; Williamsburgh, N. Y., 90; Wilmington, N. C., 1.00@1.10.

* And discharging. 3c. per bridge extra. † Alongside.

MARKETS.

NEW YORK, Friday Evening, May 4.

Prices of Silver per ounce troy.

Apl.	Sterling exchange	Lond'n Pence.	N. Y. Cents	May	Sterling exchange	Lond'n Pence.	N. Y. Cts.
28	4.87½	*	93⅛	2	4.87½	42½	92¾
30	4.87½	*	93⅛	3	4.87½	42½	9..¾
May				4	4.87½	42⅜	92½
1	4.87½	42⅝	93				

* 42 11-16.

Market has been a declining one, which the reduction of 10 lacs in the offerings of the India Council per week has not been sufficient to arrest.

Foreign Bank Statements.—The governors of the Bank of England at their weekly meeting made no change in its rate for discount, and it remains at 2 per cent. During the week the bank lost £900,000, and the proportion of its reserve to its liabilities was reduced from 40·84 to 37·27 per cent, against a decline from 50·09 to 48·28 per cent in the same week of last year, when its rate for discount was the same as now. Thursday the bank lost £100,000 bullion on balance. The weekly statement of the Bank of France shows a gain of 6,825,000 francs gold and a gain of 4,825,000 francs silver. The weekly statement of the Imperial Bank of Germany shows a specie gain of 8,300,000 marks.

Copper.—Although business has been very quiet during the week just past, it has been a very eventful week in the metal market, the enormous collapse in tin having to some extent affected the values of all other metals. Still, taking all things into consideration, copper has been well sustained, and the comparatively slight decline in quotations has been caused by a few sales on account of parties holding tin, who by mutual arrangement with the other interested parties, felt compelled to close their contracts for copper. The effect of this decline is already observed in a renewal of export orders, which confirms our previous statements that the present range of prices may be considered pretty safe. The entire stock of copper is becoming more and more concentrated during the control of the syndicate, and the limited quantity at present left in other hands seems likely sooner or later to follow in the same direction. As seems but natural under the present conditions of the market consumers have held back their orders more than ever during the past week, but as with very few exceptions they are very poorly supplied with stocks, this feature can only be of temporary duration, and it might be well to warn them against waiting in the expectation of a collapse in the prices of copper such as has taken place in the tin market, for the conditions existing in the two markets are entirely different. The present lull therefore offers a favorable opportunity to buy supplies on a lower level of prices than could otherwise have been anticipated. Our present quotations are spot and May, 16·35, these being the only deliveries which have suffered (and the cause for this is explained above), while the quotations for futures remain June, 16·40; July, 16·45; August, 16·35; September, 16·25. In London the market has hardly varied at all during the week, with the exception of Chili Bars three months forward, which close at £75 5s.@£75 10s. (this quotation being nominal without any business doing), while Chili Bars spot continue steady at £80@£80 2s. 6d. According to cable advices received from Messrs. Henry R. Merton & Co., of London, the statistics of visible supplies of copper show an increase of 2500 tons for the second half of April.

A telegram to the Boston News Bureau, May 3d, says: "Calumet output April, 2469 tons. Two small openings have been made at No. 1 and No. 2 Hecla shaft. Nothing coming up but gas; no sign of fire. Charcoal gas is being sent down No. 1 Hecla and No. 3 Calumet shafts. Fans will probably not be put to work for some days yet."

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

To Liverpool—	Copper matte.		Lbs.	
By S. S. Germanic	Bbls	225	222,965	$10,000
To Liverpool—	Copper.			
By S. S. City of Chicago	Casks	125	105,000	19,280
" Puerto Riqueno	Casks	63	25,200	4,200
	Bbls	13	.....	.....
To Liverpool—	Old yellow metal.			
By S. S. Alaska	Pkgs	85	.....	.....
	Old brass in transit.			
By S. S. Puerto Riqueno	Pkgs	47	15,111	689
To Hamburg—	Copper bullion.			
By S. S. Hammonia	Bars	12	756	1,100
	Old copper in transit.			
By S. S. Hammonia	Pkgs	30	33,577	3,357

Tin.—To a very great extent the attention of all dealers and operators in metals has been absorbed in the tremendous collapse in tin. When we last reported the quotation for spot tin in London was £166 per ton, that being the closing quotation at the end of last week. On Monday last the price dropped down to £110, and the following day £15 a ton to £95, and since then the market has continued to decline, and the present quotations are £84 for spot, and futures entirely nominal.

Of course, such a sudden break down in quotations in London could not but be reflected on our market, and our quotations have naturally followed suit. Last week we had to quote Spot 29 cents per lb.; April, 28½; May, 24·75; and to-day quotations are: Spot, 23; May, 20; June, 19.

Business in the article has been completely paralyzed during the week; but as far as has yet transpired no serious difficulties have resulted from the decline, as for some time past the speculators and many of the dealers have shown great distrust in the stability of the recent highly inflated quotations, and those who have had the misfortune to be caught are generally understood to be well able to meet all contingencies.

Under all the circumstances, we may congratulate ourselves that the collapse has not proved more disastrous. It will not be forgotten that for a considerable time past we have consistently warned our subscribers from entering into any extensive dealings in such a dangerous market. It is now reasonable to expect a more regular and steady business, as present quotations are much nearer the intrinsic value of the article than for some time past.

According to cable advices from Messrs. Henry R. Mertin & Co., of London, the statistics of visible supplies for the second half of April show an increase of 1300 tons.

Lead.—The market has remained quiet but steady at 4·55c. for Spot and 4·60 for May and June. The business done, however, has been nil, the only operator in the market just now no doubt preferring to leave matters alone in the present unsettled state of the metal markets. In London Spanish lead has experienced another decline, and after having touched £13 7s. 6d. yesterday, is according to cable advices of to-day £13 5s.

Messrs. Everett & Post, of Chicago, telegraph to-day as follows: The market remains about the same; if anything, a shade weaker. The decline is effected by the absence of buyers, owing to uncertainty as to future prices. Stocks are fully adequate for present requirements of consumers. Prices are nominally 4·40c.

Spelter is dull and neglected. Domestic at 4·50@4·65, and Foreign at 5·50@5·75.

Antimony quiet and quotations unchanged, at Hallett's, 10⅝@10½; Cookson's, 13@13½.

Chemicals.—There is a slightly better feeling in the chemical market, owing to the higher ocean freight rates mentioned in our last. The spot stock of most

of the heavy chemicals is very light, and as result quite a firmness is noted in this branch.

Carbonated soda ash 48 per cent continues firm and the spot stock is very small. The price for futures is higher, 1·27½ being demanded for large lots and 1·32@1·32½ for smaller quantities. High test is nominally quoted at 1·15, but no business is done.

Caustic soda ash, 48 per cent, is improving. The limited offerings for export and the high ocean freights combine to raise the price, which has advanced to 1·27½ for futures; 1·35@1·40 is demanded for small lots in store.

Caustic soda is in better demand, through there is no quotable change in figures; 60 per cent is in the same condition as in our last week's report, in no demand, but there is a marked improvement in 70 and 74 per cent goods; 70 per cent is quoted at 2·27½; 74 per cent at 2·22½.

English sal soda continues firm, but the market is rather dull, the firmness being due to limited supplies and high freight. There is no quotable change in prices since the date of our last writing.

American sal soda is in the same condition as last week. The jobbing trade is fair, and contract orders keep manufacturers from accumulating stocks.

Refined alkali 36 per cent is not very active, but the higher tests are beginning to feel the effect of the resumption of business by the flint glass makers.

Bleaching powder is very dull, although there is a small advance in price over our last figures, nothing now being obtainable below $1.85. The Boston market is so much lower than New York that all large buyers are drawing their supplies from there.

Acetic acid is in the same position as at our last writing, and prices rule unchanged at 2¾@2½.

Sulphuric acid is also without change—a fair jobbing business, but nothing of consequence in a larger way outside the regular contracts. The quotations remain the same, 90@95 2. for large lots, $1@$1.10 for smaller quantities.

Oxalic acid continues unsettled and dull. Prices vary somewhat, but 6½c. for large quantities, and 7c. for small lots is a fair quotation.

Fertilizers continue in good demand, owing to the very backward season. We continue to quote as in our last. Dried blood, high grade, 2·25@2·30; low grade, 2·15@2·20. Tankage, high grade, $21@$21.50; low grade, $18.50@$19. Refuse bone black, $16.50@$17 per ton. Ground steamed bones, $25@$27 per ton. Fish scrap, f.o.b., factory, $25 per ton. Sulphate of ammonia, $3.25@$3.30 per cwt.

Muriate of potash is in the same condition as at our last writing. There is no change in the quctations.

Kainit is not to be had on the spot in any quantity. Some small lots ex store bring $11.50@$12 per ton. Futures for June delivery are a good deal inquired atter. The price ranges from $8.50@$9 per ton.

The demand for double manure salt has improved slightly though it can hardly be called brisk. We continue to quote 1·15@1·17, as to quantity and time of delivery.

Nitrate of soda is much firmer, the large overstock on the spot having been got rid of. Goods ex store and afloat in port bring 2·05 cents. Very little is coming forward and it is doubtful if less than 2·02½ would be accepted for futures.

Brimstone is dull on the spot and $20 is accepted for goods ex store. Advices from Sicily report the price higher, and as there is great scarcity of freight the price on futures is advancing. May delivery may be had for $19.50 per ton, but future shipments are quoted at $20@$21.

The Rarer Minerals.—Mr. H. C. Denning, General Manager of the Marion Improvement Company of North Carolina, writes us as follows:

SIR: I notice that in your excellent journal you publish a weekly register of current quotations, and that you have a list of the rarer metals. There are several of the rarer minerals now being sold which I do not find noticed in your paper. Permit me to refer to the following, which we have be n furnishing to parties, or are about to supply the market with:

	Per pound.		Per pound.
Fergusonite	$5 00	Samarskite	$ .75
Rutile	2.80	Zircon	.40

The Fergusonite carries a large percentage of yttrium, which latter article seems to be in demand for scientific purposes. Our zircon yields over 50 per cent of zirconium. The rutile contains a very large percentage of titanium. These articles are all mined in the South.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 4.

There is little to report in the iron market. Continued dullness reigns, and this is evidenced by the manufacturers postponing the receipts of the pig-iron they have contracted for. Their requirements are much lighter than they were a year ago. Consumers appear to have but a moderate degree of faith in the ability of the producers to maintain present prices, and, acting in accordance with this view, they buy only for immediate necessities.

The bugbear of the Mills tariff bill has pretty generally lost its terrors, partly because few persons believe any general measure will be passed, and partly because the proposed reduction on pig-iron would not bring in much if any foreign iron. It is certain that even if the Mills bill were to pass, the imports of iron this year would be far less than they were last, there being less demand and lower prices here.

As regards steel rails such weighty arguments have been presented to the managers of the Mills' bill, that it is believed the bill will not propose a reduction in the tariff below $14 a ton.

Scotch irons are very dull, the Southern and Western irons pressing them hard, though our cable quotations are very low indeed, almost the lowest prices on record. The prices ruling to-day will be found in our weekly register of current quotations on another page.

A very important experiment has been made with Mount Hope, N. J., magnetic iron ore. This ore contains 62·04 per cent of iron and 1·145 per cent phosphorus. By crushing and concentrating on a magnetic concentrator, the concentrates contain 71·16 per cent iron and only ·10 per cent phosphorus; in fact, experiments show that the ore may be concentrated to the Bessemer limit.

Louisville. May 1.

[Reported by HALL BROTHERS & Co.]

There has been rather an active buying spirit during the past week, and the volume of business will probably more than double that of the week previous. Various orders for 200 tons to 1000 ton lots have been booked, though prices have been gradually settling to a lower basis. The average buyer's views are somewhat under the current quotations, and in some cases they have been responded to by some furnaces by acceptances, while others have declined. The average furnace is behind on shipments and cannot book any new orders for shipment before July or August, and consequently the buyers who are in the market now trying to place orders for small quantities of iron for immediate shipment, especially of No. 2 foundry, are meeting with much difficulty in obtaining a sufficient quantity to cover their immediate requirements. One Southern company advise that they have sold 40,000 tons of various grades of iron for future delivery during a portion of last month and confidently expected their order would amount to 60,000 tons by the last of the month, all of which is indicative of a confident feeling among the larger buyers that prices have about touched bottom and that they prefer to avail themselves of the present prices rather than take chances on a reaction. Quotations cash f.o.b. cars at Louisville will be found in our weekly register of prices.

IMPORTATIONS AT NEW YORK DURING WEEK ENDING MAY 2, AND FROM JAN. 1 TO SAME DATE.

	Week. Tons.	Year. Tons.
Spelter.		
American Metal Co.,Lt.		208
Friedensville Zinc Co.		24
Naylor & Co.		47
Osgood, F.		42
Total		320
Corres. date 1887		822
Zinc Sheets.	Tons.	Tons.
H. Lemanche's Sons		10
Naylor & Co.		25
Total		35
Nickel.	Lbs.	Lbs.
McCoy & S.	5,500	82,426
Total	5,500	82,426
Antimony.	Casks.	Casks.
Total to date, 1888		1,223
Corres. date 1887		1,388
Pig Lead.	Tons.	Tons.
Hendricks Bros.		100
Total		100
Corres. date 1887		50
Tin.	Tons.	Tons.
Abbott & Co., Jere.		3,083
American Metal Co.		31½
Birdwell & French		15
Crooke Smelt. & Refin. Co.		91
Dickerson, Van Dusen & Co.		10
Hendricks Bros		89
Muller, Schall & Co.	224	525
Naylor & Co.		651
Phelps, Dodge & Co.		381
Schwarer Bros.		7
Thomson & Co., D.		58
Total	224	4,942
Corres. date 1887	115	4,072
Tin Plates.	Boxes.	Boxes.
American Metal Co.		141
Bruce & Cook	3,168	28,674
Byrne I.	2 387	9.582
Central Stamping Co.	215	9,940
Coddington & Co., T B.	7,009	54,066
Corbierre, Fellows & S.		783
Cort & Co., N. L.	5,607	37,920
Cons. Fruit Jar Co.		837
Crooks & Co, Robert.	1,251	23,464
De Mill & Co., H. R		5,334
Dickerson, Van Dusen & Co.	11,693	88,274
Lalance & Gro-jean Mfg. Co.	222	746
Lombard, Ayres & Co.		4,000
Merchant & Co.	500	3 061
Meraick & Co., C. S.		1,880
Morewood & Co., G.	1.226	4.619
Naylor & Co.		8 899
Newall Bros		158
Phelps, Dodge & Co.	21,204	148,710
Potts, W. A., Son & Co.		573
Pratt Mfg Co.	1,050	50,595
Shepard & Co., Sidney.	880	50,425
Stroud & Co	342	342
Taylor, N. & G.		150
Thomsen & Co., A A.	7,653	48,044
Warren & Co	915	915
Wheeler & Co.	225	225
Whittemore & Co., H.	1,418	22,876
Wolff & Reesing	100	13,139
Wright & Sons, Peter.		165
Total	67,995	573,274
Corres. date 1887	50,403	534,518
Pig-Iron.	Tons.	Tons.
Abbott & Co, Jere		600
Baldwin Bros. & Co.		100
Bartlett & Co., N. S.		1,900
Crocker Bros.	300	3,900
Crooks & Co., R.		700
Dana & Co.		300
Downing & Co.	51	51
Drum'ud, McCall & Co.		10
Henderson Bros		775
Holt, H N		50
Lee & Co., James.		100
Milne & Co., A.		706
Pierson & Co.		15
Sanderson & Sons.		2
Stetson & Co., G. W.	500	7,290
Walbaum, W. H.		200
Williamson & Co., Jas.	100	1,800
Total	951	19,189
Corres. date 1887	4,236	36,793
Steel & Iron Rods.	Tons.	Tons.
Abbott & Co., Jere.	260	4,020
American Screw Co.		748
Bacon & Co.		109
Carey & Moen	30	274
Cohn, M.		60
Dana & Co.		565
Downing & Co., R. F.	22	95
Galpin, S. A.	452	1,710
Heyn, A	135	1,301
Hugill, Chas.	3	33
Jacobus, E. Y.		12
Leng, J. S.		17
Lundberg, Gustaf		120
Milne & Co., A	175	1,306
Montgomery & Co.	10	48
Muller, Schall & Co.		150
Naylor & Co.	183	6,020
Newton, & S	2	2
N. Y. Barb Wire Co.		20
Page, Newell & Co.		152
Pierson & Co.		10
Pilditch, F. S.		11
Prosser, Thos		25
Roebling's Sons, J. A.	30	739
Sanderson & Son		67
Sheldon & Co., G. W.		11
Walschid C. A.		15
Washburn Mfg. Co.		35
Whittemore & Co.		1,350
Wolff & Co., R. H.	360	1,624
Total	1,662	20,749
Corres. date 1887	2,163	40.479
Steel Sheets, Billets, Forgings, etc.	Tons.	Tons.
Abbott & Co, Jere.	258	922
Arkell, Jas		17
Bowker, C. F.	15	105
Bruce & Cook	7	7
Carey & Moen		24
Cohn, M		61
Cooney, D. J.		20
Crooks, R. & Co.	111	158
Crousbey, H.	236	236
Dana & Co.	51	51
Downing & Co., R. F.	14	85
Henderson Bros.		10
Holt, H. N.		6
Hondolette & D.	22	68
Hugill, Chas.		45
Lalance & G. Mfg. Co.	29	131
Leng, J. S		10
Littlejohn, Jas	40	40
Mersick & Co.		116
Milne & Co., A.		735
Montgomery & Co.		2
Muller, Schall & Co.		5
Manas, J. & Son.		10
Naylor & Co.	62	506
Newton & S		21
Ogden & Wallace		87
Phelps, Dodge & Co.		3
Phœnix Steel Co.		20
Pierson & Co	14	185
Pilditch, F. S	53	113
Power, C. W		22
Prosser, Thomas	110	693
Roebling's Sons, J. A.		98
Sanderson & Son		40
Shotts Iron Co.		15
Strouse & Co.		7
Temple & S.		2
Union Bridge Co	58	241
Wagner, W. F.	40	2 8
Walbaum, W. H.		961
Walschid. C. A.		
Wallace, W. H & Co.		15
Whitney & Co.	27	27
Wetherill & Co		2
Wolff, R H		98
Total	1,231	7,014
Corres. date 1887	2,454	29.837
Old Rails.	Week. Tons.	Year. Tons.
Baldwin Bros.		100
Bowening & Archibald.		100
Brown Bros. & Co.		668
Crossman & Bro., W. H		1,005
Frankfort, M.		100
Geisenheimer & Co.		100
Henderson Bros		337
Neumark & Gross		1,012
Stetson & Co., Geo. W.		230
Waltam & Co.		300
Total		4,852
Corres. date 1887	5,169	73.043
Sheet Iron.	Tons.	Tons.
Coddington & Co.	30	611
Newton & S		4
Wagner, W. F		40
Whitney & Co.		5
Total	60	660
Corres. date 1887.	26	808
Bar-Iron.	Tons.	Tons.
Abbott & Co., Jere.	80	1,249
Abeel Bros.		3
Bacon & Co.		13
Downing & Co.		50
Jacobus, E. Y.		3
Lilienberg, N.		5
Lundberg, Gustaf		112
Milne & Co., A.		95
Naylor & Co.		25
Page, Newell & Co.		20
Philip, C. M.		20
Wallace & Co., W. H.		12
Wilson, J. G.		7
Totals	80	1,614
Corres. date 1887.	150	2,932
Scrap-Iron.	Tons.	Tons.
Brown Bros. & Co.		20
Burgess & Co.		172
Crossman, W. H. & Co.		47
Geisenheimer & Co.		565
Muller, Schall & Co.		15
Neumark & Gross		321
Purdon & W		75
Trowbridge & Co., D.		75
Ward & Co., J. E.		100
Total		1.390
Corres. date 1887.	788	8,494
Charcoal Iron	Tons.	Tons.
Lunberg, G.		16
Milne & Co.		15
Naylor & Co.		25
Page, Newell & Co.		45
Sanderson & Son		1
Total		102
Spiegeleisen.	Tons.	Tons.
Abbott & Co., Jere.		205
Arkell, Jas.		28
Crocker Bros.		1,004
Dana & Co.		51
Geisenheimer & Co.		28
Jansen, J. A.		9.753
Naylor & Co.	674	2,780
Perkins, C. L.	750	2,443
Pierson & Co.		1,045
Total	1,424	17,927
Corres. date 1887.	3,348	31,663
Iron Ore.	Tons.	Tons.
De Flores, R.	722	2,304
Earnshaw, A.		3.705
Ennis & Co		1,021
Naylor & Co.		2,706
Wright, Chas. L. & Co.		880
Total	722	10.616
Corres. date 1887	791	11,355

EXPORTS.

	Week. Pounds.	Year. Pounds.
Copper.		
Abbott & Co., Jere	415,544	4,336,927
Amer. Metal Co., Ld.	50,700	3,455,050
Becker & Co., H.		1,250
Bridgeport Copper Co.		112,000
Copper Queen Cons. Mg. Co.		224,034
Herold, Emil		250,000
Ismay, J. Bruce		112,000
Ledoux & Co		110,276
Lewisohn Bros.	90,523	4,121,504
Lomal, F. A.		2,691,293
Mendel, S		560,000
Muller, Schall & Co.		1,105,000
Neumark & Gross		120,143
Orford Copper & Sulphur Co.		349,881
Parsons & Co		67,500
Phelps, Dodge & Co.		230,664
Pope's Sons & Co., Thos. J.		1,282,530
Todd & Co., J. Kennedy		112,026
Total	554,767	19,242,948
Corres. date 1887.		2,241,130
Copper Matte.		
Abbott & Co		295,000
Amer. Metal Co., Ld.		1,019,297
Ledoux & Co		469,720
Lewisohn Bros.		1,004,480
Nichols & Co	222,965	222,965
Williams & Terhune	111,450	21,654,369
Total	334,415	24,665,450
Corres. date 1887.		3,931,292

WEEKLY REGISTER OF

CURRENT QUOTATIONS.

CHEMICALS.

Acid—Acetic ....2⅝@2¾
Muriatic, 18°, per 100 lbs 1.20
Muriatic, 20°, per 100 lbs..... 1.35@1.50
Nitric, 36°, per 100 lbs ..... 4.50@5.00
Nitric, 42°, per 100 lbs..... 6.00
Oxalic.....6¼@7
Sulphuric, 60°, per 100 lbs..... 90
Sulphuric, 66°, per 100 lbs 1.10
Alkali—36 p. c..... 1.10@1.15
48 p. c .....1.2½@1.25
Refined, 58°..... 1.15
Alum—Lump, per lb..... 1¾
Ground, per lb 2½
Lump per ton, Liverpool £5
Sulphate of Alumina £3 15
Aqua Ammonia—18°, ℔ lb..... 4
20°, ℔ lb..... 5
22°, ℔ lb 6¾
26°, ℔ lb..... 9¾
Ammonia—Sul., per 100 lbs. 3.00@3.50
Carb, per lb..... 7¾
Muriate, per lb..... 7
Arsenic—White, powdered, ℔ lb.3¼@3½
White, glass..... 5½
Red, per lb 5½
White, at Plymouth, per ton. £10 7 6
Asbestos—Am., p. ton.....$20@$100
Italian, p. ton, c. i. f. L'pool ...£18 0 0
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb ..... 5@6c.
Hard, ℔ ton..... $28.00
Trinidad, refined, ℔ ton $30.00
Barytes—Sulph., Am. prime white16.00
Sulph., foreign, floated, p. ton....19.00
Sulph., off color, p. ton 12.50
Carb., lump, f. o. b. L'pool, ton ..£6 0 0
No. 1, casks, Runcorn " "£4 10 10
No. 2, bags, Runcorn " " 3 15 0
Bleach—Over 35 p.c., ℔ lb.1.82½@1.95
Borax—Per lb 7¾
Refined at Liverpool, per ton..£28 10
Brimstone—*See Sulphur.*
Bromine—Per lb..... 36
Cement—Kosendale, per bbl..... 1.00
Portland, American, per bbl..... 2.00
Portland, foreign, per bbl..... 2 25
Chalk—Per ton..... 3.00
Precipitated, per lb..... 4
China Clay—English, per ton....18.50
Southern, per ton 13.50
Chrome Yellow—Per lb 8
Cobalt—Oxide, per lb..... 270
Copper—Sulph. English Wks ,ton£24
Precip., Eng. Wks, unit...fluctuating
Copperas—Common, per 100 lbs.$ 65
Best, per 100 lbs..... 1.00
Liverpool, per ton, in casks, £1 16 1.20
Cream of Tartar—Am. 99%....32@32¾
Powdered, 99 p c..... 33½
Emery—Grain, per lb 4
Flour, per lb 2½
Feldspar—Ground, per ton.....14.00
Fuller's Earth—Lump, per bbl. 95
Powdered, per lb 2
Gypsum—Calcined, per bbl..... 1.25
Iodine—Resublimed..... 3.60
Kainit—Per ton..... 11.50
Kaolin—*See China Clay.*
Lead—Red, per lb..... 6
White, American, in oil, per lb.... 6½
White, English, per lb 7½
Acetate, or sugar of.....13@13½
Lime Acetate—Amer. Brown.1.60@1.65
" Gray.2.37½@2.40
Litharge—Powdered, per lb ..... 6@6¾
English flake, per lb..... 9
Magnesite—Syrian, per ton..... 15.00
Manganese—lump, c. i. f. Liverpool, per ton £3 2 6
Per unit, up or down..... 1s. 6d.
Ground £5 10
Mercuric-Chloride—(*Corrosive Sublimate*) per lb..... 55
Mineral Wool—Per lb..... 2
Mica—
In sheets according to size, 1st quality, ℔ lb.....25@$6 00
Phosphate Rock—S. Carolina, per ton f. o. b. Charleston..... 5.80
Ground, f. o. b. New York..9.00@ 9.50
Canadian Apatite, lump, f. o. b. at shipping port, per unit..... 24
Phosphorus—Per lb..... 65
Plumbago—Ceylon, per lb.... 4@5
American, per lb..... 5@7
London, per cwt..... £0 15 0
Potassium—Cyanide, per lb....39@41
Bromide, per lb..... 37
Chlorate, per lb..... 15¼@15½
Carb. per lb 5
Caustic, per lb..... 7½
Iodide ..... 2.70@2.75
Muriate, per 100 lbs..... 1.77½@1.80
Nitrate, refined, per lb..... 6
Bichromate, per lb..... 10½
Sulphate, per 100 lbs..... 1.10
Yellow Prussiate, per lb..... 19
Red Prussiate, per lb..... 42
Pumice Stone—Select lumps, lb. 3@5
Original cks., per lb..... 1¾
Powdered, pure, per lb..... 2
Pyrites—Non-cupreous, p. unit, s. 10
Quartz—Ground, per ton 18.00
Rotten Stone—Powdered, per lb. 8½
Lump, per lb..... 5
Eng., powdered, per ton £4
Lump, per ton..... £5
Salt—Liverpool, ground per bbl. 70
Turk's Island, per bbl 25
Salt Cake—Per 100 lbs..... 50
Saltpeter—Crude, per lb..... 4½
Refined, per lb..... 6
Soda Ash—Carb.,48 %100 lb...1.95 @1.30
Caustic, 48 %..... 1.22½@1.25
High test ..... 1.12½@1.15
Soda Caustic, 60%.....2.40@2.50
" " 70%..... 2.25
" " 74–5%..... 2.20
Sal, English, per 100 lbs..... ..1.10@
Sal, American, per 100 lbs..... 1.15
Nitrate, per 100 lbs..... 2.05
Strontium—Nitrate per lb..... 10½
Sulphur—Roll, per lb..... 1¾
Flour, per lb 2
Crude Brimstone, 2s., ℔ ton...19@19 50
Crude Brimstone, thirds, per ton 19.00
Talc—Ground French, per lb.. ... 1¼
Domestic, per lb..... 6
Domestic, per ton..... 15.00
C. f. Liverpool, per ton..... £4 5 0
Tannin—Pure, per lb..... .....
Vermillion—American, per lb... 50
English, per lb..... 65
Vitriol—(Blue), Ordinary, per lb.. 5½
Extra, per lb 6
Zinc Oxide—Am., Dry, per lb.... 4½
Antwerp, Red Seal, per lb..... 6@6½
Paris, Red Seal, per lb.....6½@7

* Spot.

BUILDING MATERIAL.

Bricks—Pale, per 1,000 ..... 5.00
Jerseys, per 1,000 ..... 7.50
Haverstraw, per 1,000 ..... 8.50
Front bricks, per 1,000, from.....10.00
Building Stone—Amherst freestone, per cu. ft., from..... 75
Brownstone, per cu. ft., from..... 1.00
Granite, rough, per cu. ft., from.. 45
Slate—Purple and green roofing, per 100 ft..... 6.00
Red roofing, per 100 sq. ft.... 15.00
Black, roofing, per 100 sq. ft. ... 5.00

THE RARER METALS.

Aluminum—(Metallic), per lb...11.00
Arsenic—Metallic, per lb..... 32
Barium—(Metallic), per lb.....975.00
Bismuth—(Metallic), per lb..... 2.40
Cadmium—(Metallic), per lb..... 1.45
Calcium—(Metallic), per oz.....150.00
Cæsium—(Metallic).....
Cerium—(Metallic). per oz..... .160.00
Chromium—(Metallic), per lb...200.00
Cobalt—(Metallic), per lb..... 6.00
Didymium—(Metallic), per oz...160.00
Erbium—(Metallic), per oz.... ..140.00
Gallium—(Metallic), per oz 3250.00
Glucinum—(Metallic) 4.50
Indium—(Metallic), per oz..... 158.00
Iridium—(Metallic), per lb.. ...700.00
Lanthanum—(Metallic), per oz.175.00
Lithium—(Metallic), per oz.....160.00
Magnesium—Per lb..... .. 4.50
Manganese—Metallic, per lb... 1.10
Mercury—*See Quicksilver.*
Molybdenum—(Metallic) per oz. 6.00
Nickel—(Metallic), per lb..... .65
Niobium—(Metallic), per oz.....128.00
Osmium—(Metallic), per lb 640.00
Palladium—(Metallic), per lb...512.00
Platinum—(Metallic), per lb. ..128.00
Potassium—Metallic, per oz.... 2.00
Rhodium—(Metallic), per lb....512.00
Ruthenium—(Metallic), per oz. 112.00
Rubidium—(Metallic), per oz....200.00
Selenium—(Metallic), per oz.. .. 3.00
Sodium—(Metallic) per lb. 4.50
Strontium—(Metallic) per oz..128.00
Tantallum—(Metallic) per oz...144.00
Teiurium—(Metallic) per oz..... 9.00
Thallium—(Metallic) per oz..... 3.00
Titanium—(Metallic) per oz....32.00
Thorium—(Metallic) per oz.....272.00
Tungsten—(Metallic) per oz..... 1.25
Vanadium—(Metallic), per oz..320.00
Yttrium—(Metallic), per oz 144.00
Zirconium—(Metallic), per oz..240.00

METALS.

Aluminum—
Bronze (10 %), ℔ lb..... 46c.
Copper—
Lake Ingot, Spot, ℔ lb.... 16·65@16·80c.
Electrolytic, ℔ lb ..... 16·50c.
Casting Brands, ℔ lb. ... 15·75@16·00c.
Chili Bars, London, ℔ ton..... £80 5s.
Sheet Copper (according to size), ℔ lb..... .....25 @38c.
Lead—
Domestic, Common, Spot....4·65@4·75c.
Foreign..... .....5 10@5·20c.
Sheet, ℔ lb ..... 6½@6·60c. net
Pipe, ℔ lb ..... 6c. "
Tin lined Pipe, ℔ lb..... 12c. "
Shot, ℔ lb..... 6 @ 7c.
Tin—
Tin Plates..... .. .. 14s. 6d.
Tin Spot..... ..... £166 5s.
Banca pigs, ℔ lb..... .. 36·50c.
Zinc—
Domestic spelter, ℔ lb.....4·70@4⅞c.
Foreign spelter, ℔ lb... ... 5·65@5·75c.
Silesian, ton..... £18 10s.
Sheet, American, ℔ lb ..... 6¼@6¾c
Antimony—Hallet's, per lb.10·50@10·75
Cookson's, per lb..... 13
Star Antimony..... £46
Quicksilver—Per lb.....61@63c.

IRON AND STEEL.

American Pig-Iron,
No. 1 X ....$20.00@$20.50 at tidewater
No. 2 X.... $18 50@$19.50 " "
Forge.... ..$16.50@$17.00 " "
Scotch Pig—Coltness....$20.50@ .....
Clyde..... 19.50@$19.75
Dalmellington..... 19 00@ ...
Summerlee..... 20 50@ .....
Shotts..... 20.50@ 20.75
By Cable to-day to the Metal Exchange :
Scotch Warrants.....38s. 3d.
Coltness, at Glasgow..... .....48s.
Langloan, at Glasgow..... .....45s.
Summerlee, at Glasgow.....47s. 6d.
Gartsherrie, at Glasgow..... .....44s. 9d.
Glengarnock, at Aidrossan.....44s. 3d.
Dalmellington, at Ardrossan.....40s.
Eglinton, at Ardrossan ... .39s. 3d.
Bessemer Pig—
Foreign, nominally..... $19.50@$20.00
Domestic ....18@18.50 at furnace
Spiegeleisen—
German, 20 per cent..... $26.50
English, 20 " " .....$26.50@ 27.00
" 30 " " ..... 31.00@ 31.50
Ferro Manganese..... 51.00@ 52.00
Steel Blooms, nominally. 30.00@ .....
Steel Billets, " 30.00@ .....
Steel Nail Slabs, " 30 50@ .....
Steel Wire Rods, " 40.50@ 41.00
Steel Rails—
Heavy sections, at mill....$31.50@ 32.50
Light " " ..... 32.50@ 37.50
Structural Iron and Steel—
Bridge Plate, at mill.. .....2·00@2·1c.
Angles, at mill ..... .2·10@2·15c.
Tees, at mill..... .2·40@2·50c.
Steel Angles, at mill..... .2·20@2·30c.
Beams and Channels, on wharf, 3·3c. base
Steel Plates—
Tank and Ship, on wharf..... 2·5@2·6c.
Boiler Shell, on wharf.... .....2·9@ ....
" Flange, " .... 3 @3¼
" Fire-Box, on wharf.... 4 @4¼
Iron Plates—
Common tank, on wharf....2·15@2·20c.
Refined tank, on wharf.....2·2@2·4c.
Boiler shell, " ... .2¼@
Boiler flange, " ....3¼@3½
Extra flange, " .....4 @
Bar Iron—
Best refined.....2@2·1c. base.
Refined..... .... 1·9@2c. "
Common .... 1·8@1·9c. "
Merchant Steel—
American tool .... 8½@10c.
Special grades..... 13 @20c.
Crucible machinery..... 5 @6c
" spring..... ... 4½c.
Bessemer machinery.....2·45@2·7c.
" spring. . .. . 2·7@2·9c.
Cast-Iron Pipe—
According to size..... $27.00@$34.00
Wrought-Iron Pipe—
Butt-Welded, Plain and Tarred, 47½ per cent disc.; Galv., 37½ per cent disc.
Lap-Welded, Plain and Tarred, 60 per cent disc ; Galv., 45 per cent disc.
Boiler Tubes—Per cent disc 60%
Rail Fastenings—
Spikes..... .....2·1 @2·15c. delv'd
Angle Fish-bars..... .1·9 @2
Bolts and Sq. Nuts.....2·8 @2·9c.
" " Hex. " .....3c. @3·1c.
Wrought Scrap—
Foreign, *ex store*.....$19.50@$20.00
No. 1 Yard *to vessel*..... 19.50@ 20.00
Cast Scrap ..... 15.50@ 16.50
Old Car Wheels.... ..... @ 19 50
Old Rails—Tees ..... 20.50@
—Doubles ..... 21.00@21.50
Nails—In car-load lots.. .. 1·90@1·95c.
—From store .... 2·00@2·10c.

Louisville Prices.

Hot Blast Irons—
So. Coke, No. 1..... ....$17.50@$18.00
" " No. 2..... 16.50@ 17 00
" " No. 2½ ..... 16.00@ 16.50
Mahoning Valley (Lake Ore Mixture) ..... 18.75@ 19.25
So. Charcoal, No. 1..... 18.50@ 19.00
" " No. 2 ..... 17.50@ 18.00
Missouri Charcoal No. 1.... 20.00@ 20.50
" " No. 2.... 19.00@ 19.50
Forge Irons—
Neutral Coke..... .....$15.00@$15.50
Cold Short ..... 14.00@ 15.25
Mottled..... 13.00@ 14.00
Car Wheel and Malleable Irons—
Southern (standard brands),$23.00@$24 00
" (other brands)..... 19 00@ 20 00
Lake Superior..... 23.00@ 24.50

Pittsburg Prices.

Coke or Bituminous Pig—
Foundry No. 1..... .....$17.25@17.50
Foundry No. 2..... ..... 16.25@16.50
Gray Forge No. 3..... 15.00@15.25
" " No. 4 .... 14.75@15.00
White .... 15.00@15.25
Mottled..... .....
Silvery .... 16.50@18.00
Bessemer..... 16.50@17.00
Charcoal Pig—
Foundry No. 1. ..... 23.50@24.50
Foundry No. 2..... .. 22.50@24.00
Cold-Blast..... ..... 25.00@26.00
Warm-Blast..... 24.00@25.00
20 p. c. Spiegel..... 28.00@28.50
Muck-Bar..... ..... 26.75@27.00
Steel Blooms..... ..... 28.00@ .....
Steel Slabs ..... 28.00@28.50
Steel Crop Ends..... ..... 18.00@ .....
Steel Bloom Ends.. ....@17.50
Steel Billets..... ..... 28.5C@29.00
Old Iron Rails..... .. 22.50@23.25@24.00
Old Steel Rails..... ..... 20.00@21.00
No. 1 W. Scrap..... ..... 19 00@19.50
No. 2 W. Scrap.. .... 18.00@18.50
Steel Rails..... ..... *31.50@32.00
" light sections.. .....*33.00@34.00
Bar Iron., nominal..... 1.85@ 1.90
Nails ....$1.90 usual discount
Steel Nails..... .... $1.90
Two per cent off for cash.
* At works.

Philadelphia Prices.

Foundry No. 1..... ... $20.00@21.00
Foundry No. 2. ..... 18.00@18.50
Gray Forge..... ..... 15.50@17.00
Bessemer Pig..... ..... 19.50@20.00
Steel Rail Blooms ..... 29.50@nom.
Foreign Bessemer..... 19.5c@20.00
Spiegeleisen. ..... 26.50@27.00
Scrap, Selected..... 22.00@.....
No. 1 .... 21.00@20.00
Cargo Scrap..... ... ... 21.00@20.50
Muck-Bars..... ..... 28.00@29.00
Merchant Iron..... ..... 1.75@ 1.95
Plate Iron..... ... 2.00@ 2.15
Tank Iron .... 2.10@ 2.20
Skelp Iron..... ..... 1.80@ 1.90
Angles..... ... 2.10@.....
Beams and Channels..... .. 3.30.@.....
Nails .... 1.90@ 2.00
Steel Rails..... ..... 31.50@33.50
Old Rails..... ..... 21.00@. ....

STOCK MARKET QUOTATIONS

Baltimore, Md.

COMPANY.	Bid.	Asked.
Atlantic Coal	$1.50	$1.60
Balt. & N. C.	.27@ .30	.31@ .35
Big Vein Coal	.....	.....
Conrad Hill	.05@ .07	.10
Diamond Tunnel	.60	.70
George's Crk. C.	90@100	110
Lake Chrome	.05	.11@.15
N. State, Balto.	.25	.32@.33
Ore Knob	.05	.07@.12
Silver Valley	.50@.90	1.15@1.25

Highest and lowest prices bid and asked during the week ending May 3d.

Birmingham, Ala.

COMPANY.	Bid.	Asked.
Ala. Conn. C.	....	....
Bir. Min. & Mfg.	...	185 @195
Decat. L. Imp. & Fur.	19 @19½	20¼@ 21
DecaturMin. L.	19½	28 @ 28¾
Enterprise Mfg. Co	...	
Sloss I. & S.	....	....
* Sloss I. & S.	....	81
Sheffield C. & I.	....	†76½@ 83½
WoodstockS&I	49	...

* Bonds.
† Seller, 60 days.
Highest and lowest prices bid and asked during the week ending May 1st.

Pittsburg, Pa.

COMPANY	H.	L.	Closing.
Bridgewater Gas	.....	.....	.....
Charlotte Mg. Co.	.....	.....	.....
Chartiers Val. Gas.	85.00	81.00	82.00
Columbia Oil Co.	.....	...	.....
Consignee Mg. Co.	.....	.....	.....
Forest Oil Co	.....	...	.....
Gogebic I. Syn	.....	.....	.....
Iron City Mining	3.50	3.38	3.50
Kittanning Gas	.....	.....	.....
La Noria Mining	3.75	3.13	3.50
Lustre Mining	8.00	1.00	8.00
M'f'turers' Gas	38.00	36.00	38.00
Nat. Gas Co. of W. Va	68.00	66.00	66.00
N. Y. & C. Gas Coal	.....	.....	.....
Ohio Valley Gas	40.00	40 00	40.00
Pennsylvania Gas.	22.50	22.50	22.50
People's Nat. Gas.	.....	.....	.....
Philadelphia Gas	48.50	48.00	48.25
Pine Run Gas	.....	.....	.....
Silverton Mining	2 50	1.50	2.50
South Side Gas	.....	.....	.....
Tuna Oil Co	64.00	64.00	64.00
Washington Oil	50.00	45.00	45.00
W'st'h'se Air-Brake	122.50	121.00	122.50
West'house Brake	64.75	60.00	60.00
Westmoreland & Cambria Gas	.....	.....	.....
Wheeling Nat. Gas.	25.00	20.00	24.00
Yankee Girl Min.	... ..	.....	.....

Highest and lowest prices bid and asked during the week ending May 3d.

Foreign Quotations.

London. April 20.

COMPANY.	Highest.	Lowest.
Alturas Gold, Idaho	16s.	15s.
Arizona Copper, Ariz.	22s. 6d.	22s.
Birdseye Creek, Cal.	9s.	7s.
Carlisle, N. Mex	25s.	22s. 6d.
Centennial, Cal.	10s.	8s.
Colorado United, Colo.	5s	3s.
Columbian, S. A.	27s. 6d.	25s.
Denver Gold, Colo.	3s.	2s.
Dickens Custer, Id.	8s.	7s.
Eberhardt, Nev	2s.	1s.
El Callao, Venezuela	£4	£3¾
Empire, Mont	23s. 9d.	21s. 3d.
Flagstaff, Utah	5s.	4s.
Garfield, Nev	25s.	22s. 6d.
Gold Hill, N. C.	2s. 6d.	1s. 6d.
Idaho	17s. 6d.	16s. 6a.
Ilex, Cal.	20s.	17s. 6d.
Josephine, Cal	£2½	£1½
Kohinoor, Colo.	2s. 6d.	2s.
Lady Franklin N. Mex.	8s.	6s.
Mason & Barry, Portugal	£13	£12¾
Montana Lt., Mont	£2¼	£2⅛
New California, Colo.	7s. 6d.	6s. 6d.
New Emma, S., Utah.	7s. 6d.	6s. 6d.
New Hoover Hill, N. C.	2s. 6d.	1s. 6d.
New La Plata, Colo.	2s. 6d.	1s. 6d.
Pittsburg Cons., Nev.	46s.	45s.
Plumas Eureka, Cal.	£1	£¾
Quebrada, Venezuela	£5⅛	£5⅜
Richmond Con., Nev.	£4⅝	£4⅜
Ruby&Dunderberg,Nev	3s. 6d.	2s. 6d.
Russell Gold, N. C.	5s. 6d.	4s. 6d.
Sierra Buttes, Cal.	£⅞	£⅝
Stanly, N. C.	£1	£⅞
Tolima, Colombia, S.A.	£2¼	£1⅞
Union Gold, Colo.	5s. 6d.	4s. 6d.
U. S. Placer, Colo.	£¾	£⅝
Viola Lt., Idaho	25s.	20s.

*Paris.**	April 19.
Boleo 650	650
El Callao..... 100	100
Golden River 450	450
" parts.. .. 85	85
" obligations 85	85
Lexington. 80	80
" parts..... 4	4
Rio Tinto.... .....478.75	478.75
" obligations...508.75	508.75
" nouvelles... .502.50	502.50
Tharsis 141.25	141.25

* Francs.

DIVIDEND-PAYING MINES.

No.	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and amount of last			Dividends. Total paid.	Date and amount of last		
1	Adams, S. L.	Colo.	$1,500,000	150,000	$10	*				$555,000	Jan	1887	15
2	Alice, S. C	Mont	10,000,000	400,000	25	*				750,000	Sept	1886	.06¼
3	Alturas, G	Idah.	1,500,000	300,000	5					95,000	Sept	1886	50
4	Amy & Silversmith, S.	Mon.		311,419						247,530	Aug	1887	.12½
5	Atlantic, C.	Mich	1,000,000	40,000	25	$280,000	Apl.	1875	$1.00	420,000	Feb.	1888	1.50
6	Argenta, S	Nev.	10,000,000	100,000	100	325,000	July	1885	.10	40,000	Feb.	1880	20
7	Aurora, I.	Mich.	2,000,000	100,000	20					165,000	Oct	1887	1.87½
8	Bassick, G. S.	Colo.	10,000,000	100,000	100	*				400,000	Mar.	1884	1.00
9	Belle Isle, S.	Nev.	10,000,000	100,000	100	145,000	Feb	1887	20	300,000	Dec.	1879	.25
10	Belcher, G. S.	Nev.	10,400,000	104,000	100	2,666,000	Mar.	1888	.50	15,397,200	Apl	1876	1.00
11	Bellevue Idaho, S. L.	Idah.	1,250,000	125,000	10	57,500	Nov.	1887	2	187,500	Jan	1887	.10
12	Big B'nd Hydraulic, G	Dak.	1,000,000	200,000	5	*				253,000	Aug	1887	.03
13	Black Bear, G.	Cal.	3,000,000	30,000	100	22,500	Dec.	1884	.25	895,000	May	1883	.20
14	Bodie Con., G. S.	Cal.	10,000,000	100,000	100	450,000	Feb.	1888	.50	1,295,000	Apl.	1885	.50
15	Bonanza Developm't	C & M	3,000,000	300,000	10					135,000	Oct.	1882	.15
16	Bonanza K'g, Cons. S.	Cal.	1,000,000	100,000	10	*				185,000	Feb.	1885	.10
17	Boston & Mont, G.	Mont	2,500,000	250,000	10	*				520,000	Jun	1886	.15
18	Breece, S.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
19	Brooklyn Lead, L. S.	Utah	500,000	50,000	10					127,000	July	1887	.05
20	Bulwer, G.	Cal	10,000,000	100,000	10	60,000	July	1887	20	175,000	Jan.	1884	.10
21	Caledonia, G	Dak.	10,000,000	100,000	100	505,000	May	1885	.15	40,000	Feb.	1886	.10
22	Calumet & Hecla, C	Mich	2,500,000	100,000	25	1,200,000				29,850,000	Apl	1888	5.00
23	Carbonate Hill, S. L.	Colo.	2,000,000	200,000	10	*				80,000	Apl.	1884	.05
24	Caribou Con., S.	Colo.	1,500,000	150,000	10	*				50,000	Mch	1880	.10
25	Castle Creek, G.	Idah.	100,000	100,000	1					51,000	Oct.	1883	.03
26	Catalpa, S. L	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
27	Central, C	Mich	500,000	20,000	25	100,000	Sept	1861	.06	1,860,000	Feb.	1888	2.00
28	Christy, S.	Utah	10,000,000	100,000	100					10,000	Jun	1885	.10
29	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec	1884	.25
30	Colorado Central, S. L	Colo.	2,750,000	275,000	10	*				296,250	Apl	1888	.05
31	Cons. Cal. & Va., G. S	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	1,634,800	Apl	1888	.50
32	Con. Gold Mining, G.	Ga.	500,000	100,000	5	*				108,000	Nov.	1888	02
33	Contention, S	Ariz.	12,500,000	250,000	50					†2,587,000	Dec.	1884	.25
34	Crescent, S. L. G.	Utah	15,000,000	600,000	25					210,000	Aug.	1886	.05
35	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,775,000	Apl.	1888	.50	11,588,000	Jan.	1875	2.00
36	Daly, S. L.	Utah	3,000,000	150,000	20					525,000	Mar	1888	.50
37	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				§1,000,000	Nov	1887	.10
38	Derbec B. Grav., G. S.	Cal.	10,000,000	100,000	100	90,[illegible]	Dec.	1881	.10	180,000	May	1887	.10
39	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				330,000	Apl	1888	15
40	Eclipse	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
41	Elkhorn, G. S	Mont	1,000,000	100,000	10	50,0[illegible]	July	1883	.50	170,000	July	1887	.05
42	Empire Lt., G.	Mont	500,000	100,000	5					7[illegible],500	Oct.	1887	.37½
43	Eureka Con., G. S. L.	Nev.	5,000,000	50,000	100	500,000	July	1886	1.00	4,906,000	May	1888	.25
44	Evening Star, S. L.	Colo.	500,000	30,000	10	*				1,400,000	Nov	1883	.50
45	Excelsior, G.	Cal.	10,000,000	100,000	100	560,000	Sept	1885	1.00	875,000	Oct.	1880	.25
46	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov	1878	1.00	1,125,000	Dec.	1885	.20
47	Franklin, C.	Mich	1,000,000	40,000	25	220,000	Jun.	1871		640,000	Jan.	1888	1.00
48	Freeland, G. S. C.	Colo.	5,000,000	200,000	25	*				190,000	July	1886	.10
49	Fresno Enterprise, G	Cal.	5,000,000	100,000	50		Mch	1883	.10	110,000	July	1882	.10
50	Garfield Lt., G. S	Nev.	500,000	100,000	5					60,000	Mar	1887	.12½
51	Golconda, G. S.	Idah.	1,000,000	100,000	10					120,000	May	1888	.60
52	Gould & Curry, G. S.	Nev.	10,800,000	108,000	100	5,251,000	Mar.	1888	.50	3,826,800	Oct	1870	10.00
53	Grand Central, S.	Ariz.	1,000,000	100,000	10					625,000	Dec.	1882	.25
54	Grand Prize, S.	Nev.	10,000,000	100,000	100	570,000	Apl.	1886	.50	495,000	Mar.	1881	.25
55	Granite, S.	Colo.	125,000	125,000	1					6,250	May	1883	.01
56	Granite Mountain, S.	Mont	10,000,000	400,000	25					4,400,000	Apl.	1888	.50
57	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
58	Hale & Norcross, G. S	Nev.	11,200,000	112,000	100	5,086,000	July	1887	.50	1,654,000	May	1888	.50
59	Hall-Anderson, G.	N. S.	150,000	150,000	1					7,000	Jan.	1882	05
60	Hecla Con., S. G. L. C.	Mont	1,500,000	30,000	50					1,077,500	Dec	1887	.50
61	Hel'a Mg & Red, G. S. L	Mont	3,315,000	663,000	5	*				197,970	July	1886	.06
62	Holmes, S	Nev.	10,000,000	100,000	100	300,000	Sept	1885	10	75,000	Apl.	1886	.25
63	Holyoke, G.	Idah	200,000	200,000	1					27,000	Feb.	1883	.10
64	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July	1878	1.00	4,093,750	Apl	1888	.20
65	Honorine, S. L.	Utah	500,000	250,000	2	25,000	Jun.	1883		125,000	Sept	1887	.05
66	Hope, S.	Mont	1,000,000	100,000	10	*				233,252	Apl.	1888	.25
67	Horn-Silver, S. L.	Utah	10,000,00	100,000	25	*				4,000,000	Nov.	1884	.50
68	Idaho, G.	Cal.	310,000	3,100	100					4,89[illegible],250	Apl.	1888	7.50
69	Ideal, S. L	Colo.	1,500,000	50,000	10					15,000	Oct.	1886	.05
70	Illinois, S	N. M.	100,000	100,000	1	*				25,000	Jan.	1887	.25
71	Independence, S.	Nev.	10,000,000	100,000	100	340,000	Oct.	1886	.20	225,000	Sept	1879	.25
72	Indian Queen, S	Nev.	250,000	125,000	2					368,750	July	1883	.03
73	Iron Hill, S	Dak.	2,500,000	250,000	10	101,250	Mar.	1888	.07½	156,250	Nov.	1887	.07½
74	Iron-Silver, S. L	Colo.	10,000,000	500,000	20	*				2,200,000	Feb.	1888	.20
75	Jackson, G. S.	Nev	5,000,000	50,000	100	10,000	Nov	1880	.20	45,000	Oct.	1886	.10
76	Jay Gould	Mont	2,000,000	4[illegible]	5	*				207,000	Apl.	1888	.09
77	Jocuistita, S.	Mex.	2,500,000	250,000	10					1,200,000	Feb.	1885	.50
78	Jumbo, G.	Colo	2,000,000	200,000	10					35,000	Oct.	1887	.02½
79	Kentuck	Nev.	3,000,000	30,000	100	342,000	Nov	1881	.30	1,350,000	Dec.	1886	.10
80	La Plata, S. L.	Colo	2,000,000	200,000	10	*				610,000	Sept	1882	.30
81	Leadville Cons., S. L. I.	Colo.	4,000,000	400,000	10	*				423,000	Apl	1887	.05
82	Lexington, G. S.	Mont	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
83	Little Chief, S. L	Colo.	10,000,000	200,000	50	*				780,000	Mch	1885	.10
84	Little Pittsburg, S. L	Colo.	20,000,000	200,000	100	*				1,050,000	Mch.	1880	50
85	Manhattan, S.	Nev	5,000,000	50,000	100	250,000	Dec	1887	1.00	437,500	Feb	1886	.25
86	Marguerite, G.	Cal.	500,000	25,000	20					18,750	Oct.	1882	.25
87	Marion Bullion, G	N. C	500,000							15,000	Jan.	1886	
88	Martin White, S.	Nev.	10,000,000	100,000	100	1,150,000	Mar.	1886	25	140,000	Dec.	1886	.25
89	Mary Murphy, G. S.	Colo.	350,000	3,500	100	*				122,500	Feb.	1888	5.00
90	Minnesota, C	Mich	1,000,000	40,000	25	420,000	Apl.	1888	1.00	1,820,000	Mar.	1876	
91	Mono, G	Cal.	5,000,000	50,000	100	616,000	Sept	1887	.50	12,500	Mar.	1886	.25
92	Montana, Lt., G. S.	Mont	3,300,000	660,000	5	*				2,0[illegible]	Apl.	1888	.25
93	Morning Star, S. L.	Colo.	1,000,000	100,000	10					775,000	Mar.	1888	.25
94	Moulton, S. G.	Mont	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
95	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
96	Mt. Diablo, S	Nev	5,000,000	50,000	100	137,500	Jun.	1880	2.00	80,000	July	1885	.20
97	Napa, Q	Cal.	700,000	100,000	7					290,000	Jan.	1883	.10
98	Navajo, G. S.	Nev.	10,000,000	100,000	100	485,000	Apl.	1888	30	325,000	Feb.	1885	.25
99	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
100	Northern Belle, S	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	Apl.	1883	50
101	North Belle Isle, S.	Nev.	10,000,000	100,000	100	250,000	Mar.	1887	.50	230,000	May	1888	.50
102	Ontario, S. L.	Utah	15,000,000	150,000	100					9,125,000	Apl	1888	.50
103	Ophir, G. S	Nev.	10,000,000	100,000	100	4,059,440	Aug	1887	.50	1,595,800	July	1882	1.00
104	Original, S. C	Mont	1,500,000	60,000	25	*				117,000	Dec.	1887	.05
105	Osceola, C.	Mich	1,250,000	50,000	25	480,000	Apl.	1876	1.60	1,072,500	Dec	1887	1.00
106	Oxford, G	N. S.	125,000	125,000	1	*				33,500	Oct.	1885	.02
107	Paradise Valley, G. S	Nev.	10,000,000	100,000	100	62,000	Apl	1888	.15	150,000	Apl.	1887	.10
108	Parrott, C.	Mont	1,800,000	180,000	10					154,000	Jan.	1888	.10
109	Peacock, S. G. C.	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
110	Pleasant Valley, G. S.	Cal.	10,000,000	100,000	100	10,000	Mar	1884	.10	30,000	Dec.	1882	.05
111	Plutus, G. S. C. L	Colo	2,000,000	200,000	10	*				20,000	Feb.	1886	.10
112	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
113	Prussian, S. L.	Colo.	1,500,000	150,000	10					132,000	Jan	1883	.10
114	Quicksilver, pref., Q	Cal.	4,300,000	43,000	100					1,353,192	Apr	1888	2.00
115	" com., Q	Cal.	5,700,000	57,000	100					151,000	July	1882	.40
116	Quincy, C.	Mich	1,000,000	40,000	25	200,000	Dec.	1862		4,770,000	Feb.	1888	4.00
117	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,312,587	Jun.	1887	1.25
118	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar	1886	.50	93,785	Feb.	1880	.50
119	Rising Sun, S.	Dak.	750,000	150,000	5	*				52,000	May	1881	.07½
120	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
121	Robert E. Lee, S. L.	Colo	10,000,000	500,000	20					100,000	Dec.	1882	.50
122	Rooks, G.	Vt.	500,000	50,000	10	*				61,000	Apr	1885	.30
123	Savage, S.	Nev.	11,200,000	112,000	100	6,324,000	Sept	1887	50	4,460,000	July	1869	3.00
124	Security L. Mg., Mfg.	Colo.	1,000,000	100,000	10	*				50,000	July	1884	
125	Shoshone, G.	Idah.	150,000	150,000	1					7,500	Apl	1883	.01
126	Sierra Buttes, G.	Cal.	2,225,000	122,500	10					1,492,537	Apl.	1888	.12½
127	Sierra Grande, S.	N. M.	2,500,000	500,000	5					860,000	Sept	1884	.25
128	Sierra Nevada, G. S.	Nev.	10,000,000	100,000	100	6,100,000	Apl.	1888	.25	102,000	Jan.	1871	1.00
129	Silver Cord, G. S. L.	Colo.	5,000,00	500,000	10					225,000	Nov.	1883	.25
130	Silver King, S.	Ariz.	10,000,00	100,000	100					1,950,000	July	1887	.25
131	Silverton, G. S. L.	Colo.	2,000,000	200,000	10	*				80,000	Nov.	1886	.02
132	Small Hopes Cons., S.	Colo.	5,000,000	250,000	20	*				3,112,500	Dec.	1887	.20
133	Smuggler, S. L.	Colo.	600,000	60,000	10					66,700	Aug.	1883	.25
134	Socorro, C	N. M.	250,000	2,500	100					4,000	Mch	1882	.00¼
135	Spring Valley, G.	Cal.	200,000	2[illegible]	1	50,000	Oct.	1886	.25	50,000	Jan	1881	25
136	Standard, G. S.	Cal.	10,000,000	100,000	100	25,000	Oct.	1884	.25	3,590,000	May	1888	1.05
137	Stormont, S	Utah	500,000	[illegible]00,000	1	*				155,000	Nov.	1881	.05
138	St. Joseph, L	Mo.	1,500,000	150,000	10	*				844,000	Dec.	1887	.20
139	Surinam, G.	D. G.	3,000,000	300,000	5					105,000	Nov.	1887	.05
140	Swansea, G	Colo.	600,000	60,000	10	*				9,000	Apl.	1888	.02½
141	Syndicate, G	Cal.	10,000,000	100,000	100	38,729	July	1882	.15	48,308	Sept	1885	.10
142	Tamarack, C.	Mich.	1,000,000	40,000	2	520,000	Apl	1885	3.00	120,000	Apl.	1888	3.00
143	Tip Top, S	Ariz	10,000,000	100,000	100	250,000	Sept	1883	.25	100,000	Nov.	1881	.20
144	Tombstone, G. S. L.	Ariz	12,500,000	500,000	25	*				1,250,000	Apl.	1882	.10
145	United Verde, C.	Ariz.	3,000,000	300,000	10	*				97,500	Feb.	1884	.20
146	Valencia, M	N. H.	150,000	1,500	100					37,500	Apl	1886	2.50½
147	Viola Lt., S. L.	Idah.	750,000	150,000	5					222,500	Dec.	1887	.12
148	Vizina, S.	Ariz.	5,000,000	200,000	25					140,000	Apl.	1882	.10
149	Yankee Girl	Colo	2,500,000	250,000	10					1,275,000	July	1887	.10
150	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,448,000	Dec	1885	.7[illegible]	2,184,000	Aug	1871	1.50

NON-DIVIDEND-PAYING MINES.

No.	Name and Location of Company.		Capital Stock.	Shares. No.	Par Value.	Assessments. Total levied.	Date & amo'n of last,		
1	Agassiz Cons., S. L.	Colo.	$2,500,000	50,000	$50	*			
2	Allouez, C.	Mich	2,000,000	80,000	25	$577,000	Feb	1884	
3	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	536,250	Jan.	1888	87½
4	Alta, S.	Nev.	10,080,000	100,800	100	2,140,800	Nov	1887	.50
5	Amador, G.	Cal.	400,000	200,000	2	*			
6	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	Jun	1877	.50
7	Anglo-Montana, Lt.	Mon.	600,000	120,000	5				
8	Appalachian, Lt., G.	N. C.	1,500,000	300,000	5				
9	Aspen Mg. & S., S. L	Colo.	2,000,000	200,000	10				
10	Barcelona, G.	Nev.	5,000,000	200,000	25	*			
11	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500	Jan.	1883	.10
12	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	Apl.	1886	.10
13	Best & Belcher, G. S.	Nev.	10,080,000	100,800	100	2,004,190	Jan.	1888	.50
14	Big Pittsburg, S. L.	Colo.	20,000,000	200,000	100	*			
15	Bi-Metallic, S.	Mon.	5,000,000	200,000	25	*			
16	Black Oak, G.	Cal.	3,000,000	300,000	10	*			
17	Boston Con., G	Cal.	10,000,000	100,000	100	170,000	Nov	1883	.25
18	Boston & Mont., C. S.	Mon.	2,500,000	100,000	25	*			
19	Bremen, S.	N. M	5,000,000	500,000	10	*			
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*			
21	Bullion, G. S.	Nev.	10,000,000	100,000	100	3,957,000	Aug.	1887	.50
22	Bye and Bye	Ariz.	1,000,000	100,000	10	*			
23	Calaveras, G.	Cal.	500,000	500,000	1	*			
24	Carisa, G.	Wy.	500,000	100,000	5	*			
25	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
26	Cashier, G. S.	Colo.	500,000	250,000	2	*			
27	Cen. Contin'l, G. S. L.	C. & A	2,000,000	200,000	10	*			
28	Charles Dickens, G. S.	Idah.	1,250,000	250,000	5	*			
29	Cherokee, G.	Cal.	1,500,000	150,000	10				
30	Chollar, S.	Nev.	11,200,000	112,000	100	1,208,000	Dec.	1887	.50
31	Cinnamon Mt., G. S.	Colo.	750,000	150,000	5				
32	Cleveland, T.	Dak.	1,000,000	500,000	2	*			
33	Comstock, G. S.	Nev.	10,000,000	100,000	100	30,000	Mar.	1887	.15
34	Con. Imperial, G. S.	Nev.	5,000,000	50,000	100	1,175,000	Sept	1887	.25
35	Con. Pacific, G.	Cal.	6,000,000	60,000	100	177,000	Sept	1887	10
36	Cons. Silver, S	Mo.	2,500,000	250,000	10				
37	**Cop. Queen Cons, C.	Ariz	1,400,000	140,000	10				
38	Courtlandt	Colo.	500,000	50,000	10				
39	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
40	Crocker, S.	Ariz.	10,000,000	100,000	100	105,000	Feb.	1888	.20
41	Crowell, G.	N. C.	500,000	500,000	1				
42	Dahlonega, G.	Ga.	250,000	250,000	1	*			
43	Dandy, S.	Colo.	5,000,000	500,000	10				
44	Dardanelles, G.	Cal.	1,000,000	100,000	10				
45	Decatur, S.	Colo.	1,500,000	300,000	5	*			
46	Denver City, S. L	Colo.	5,000,000	500,000	10	*			
47	Denver Gold, G.	Colo.	300,000	60,000	5				
48	Deseret, G. S.	Utah	500,000	50,000	10	*			
49	Durango, G.	Colo.	500,000	500,000	1	*			
50	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
51	El Cristo, G. S.	U.S.C	1,000,000	500,000	2				
52	El Dorado, G	Cal.	1,000,000	250,000	4	*			
53	El Talento, G.	U.S.C	1,000,000	500,000	2				
54	Empire, S.	Utah	10,000,000	100,000	100				
55	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*			
56	Exchequer	Nev.	10,000,000	100,000	100	770,000	Feb.	1888	.20
57	Found Treasure, G. S.	Nev.	10,000,000	100,000	100	12,030	Jan.	1882	.06
58	Gogebic I. Syn., I	Wis.	5,600,000	200,000	25				
59	Gold Cup, S	Colo.	500,000	500,000	1	*			
60	Golden Era, S.	Mon.	2,000,000	200,000	10	*			
61	Gold Placer, G.	Colo.	5,000,000	200,000	25	229,314	Dec.	1885	.2[illegible]
62	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
63	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
64	Grand Belt, C.	Tex.	12,000,000	120,000	100				
65	Grand Duke	Colo.	800,000	80,000	10				
66	Great Remance, G.	U.S.C	1,000,000	500,000	2	*			
67	Gregory-Bobtail, G.	Colo.	550,000	550,000	1	*			
68	Gregory Con., G.	Mon.	3,000,000	300,000	10				
69	Harlem M. & M. Co., G.	Cal.	1,000,000	200,000	5				
70	Head Cent. & Tr. S. G	Ariz.	10,000,000	100,000	100				
71	Hector, G.	Cal.	1,500,000	300,000	5				
72	Highland, C	Mich	500,000	25,000	25				
73	Hortense, S.	Colo.	2,000,000	200,000	10				
74	Huron, C	Mich	1,000,000	40,000	25	280,000	May	1887	3 0
75	Iron Gold & Silver, S	N. M.	2,000,000	200,000	10	*			
76	Ironton, I.	Wis.	1,000,000	4[illegible]	25				
77	Iroquois, C	Mich	1,250,000	50,000	25				
78	J. D. Reymert	Ariz.	10,000,000	100,000	100	*			
79	Julia Cons., G. S.	Nev.	11,000,000	110,000	100	1,650,000	Apl.	1887	.10
80	Kearsarge, C.	Mich	1,250,000	50,000	25	190,000	Oct.	1887	1.00
81	Laclede	N. M.	2,000,000	200,000	10	*			
82	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
83	Lee Basin, S. L.	Colo.	5,000,000	500,000	10	*			
84	Lochiel, S.	N. M.	2,000,000	200,000	10	*			
85	Lucerne, S.	Colo	5,000,000	500,000	10	*			
86	Mammoth Bar., G.	Cal.	10,000,000	100,000	100	50,000	Dec.	1881	
87	May Belle, G.	Cal.	10,000,000	100,000	100	84,000	Mar.	1884	.15
88	Mayflower Gravel	Cal.	1,000,000	100,000	10	325,000	Apl.	1888	.25
89	Medora, G	Dak.	250,000	250,000	1				
90	Mexican, G. S	Nev.	10,000,000	100,000	100	2,700,760	Jan.	1888	.25
91	Middle Bar, G.	Cal.	400,000	200,000	2	*			
92	Mise & Starr, S. L.	Colo	1,000,000	200,000	5	*			
93	Monitor, G.	Colo.	100,000	100,000	1	*			
94	Moose Silver, S	Colo.	3,000,000	300,000	10				
95	Native, C.	Mich	1,000,000	40,000	25				
96	Neath, G.	Colo	1,000,000	100,000	10				
97	Nevada Queen, S.	Nev.	10,000,000	100,000	100	130,000	Dec.	1887	.50
98	New Germany, G	N. S.	100,000	100,000	1	*			
99	New Pittsburg, S. L	Colo.	2,000,000	200,000	10	*			
100	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov		
101	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
102	Oneida Chief, G.	Cal.	500,000	125,000	4	*			
103	Oriental & Miller, S.	Nev.	10,000,000	400,000	10				
104	Osceola, G.	Nev.	5,000,000	50,000	25	*			
105	Overman, G. S.	Nev.	11,520,000	115,200	100	3,737,180	Aug.	1887	.25
106	Park, S.	Utah	2,000,000	200,000	100				
107	Peer, S.	Ariz.	10,000,000	100,000	10	135,000	Nov.	1886	.10
108	Peerless, S.	Ariz.	10,000,000	100,000	100	345,000	Apl.	1888	.25
109	Phœnix	Ariz.	500,000	600,000	100				
110	Phœnix, G. S.	Ark.	5,000,000	200,000	1	*			
111	Phœnix Lead, S. L.	Colo.	100,000	100,000	25	*			
112	Pilgrim, G.	Cal.	600,000	300,000	1	*			
113	Potosi, S.	Nev.	11,200,000	112,000	2	1,293,600	Nov.	1887	.50
114	Proustite, S.	Idah	250,000	250,000	100	*			
115	Puritan, S. G.	Colo.	1,500,000	150,000	1	*			
116	Quincy	Colo.	3,000,000	300,000	10				
117	Rappahannock, G. S.	Va.	250,000	250,000	10	*			
118	Red Elephant, S.	Colo.	500,000	500,000	1	*			
119	Ropes, G. S.	Mich	2,000,000	80,000	1	103,200	July	1887	.50
120	Russell, G	N. C.	1,500,000	300,000	25				
121	Sampson, G. S. L.	Utah	10,000,000	100,000	5	188,157	Mar.	1887	.25
122	San Sebastian, G.	San S	1,500,000	3[illegible]0,000	5	*			
123	Santiago, G.	U.S.C	400,000	1,200,000	2	*			
124	Security, S.	Colo.	10,000,000	1,000,000	10				
125	Sheridan	N. M.	2,000,000	200,000	10				
126	Silver Queen, C.	Ariz.	5,000,000	200,000	25	*			
127	South Bulwer, G	Cal.	10,000,000	100,000	100	100,000	May	1881	.25
128	South Hite	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
129	South Pacific	Cal.	500,000	100,000	5				
130	Stanislaus, G	Cal.	2,000,000	200,000	10				
131	State Line, S.	Nev.	250,000	250,000	1				
132	St. Kevin, G. S.	Colo.	100,000	100,000	1	*			
133	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
134	St. Louis & St. Elmo	Colo.	2,000,000	200,000	10				
135	St. L. & St. Felipe, G. S.	Mex.	1,500,000	150,000	10				
136	St. L. & Sonora, G. S.	Mex.	1,500,000	150,000	10				
137	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
138	Sunday Lake, I	Mich	1,250,000	50,000	25				
139	Sullivan, G. S. L.	Me.	500,000	100,000	5	125,000	Dec.	1882	.2[illegible]
140	Sutro Tunnel	Nev.	20,000,000	2,000,000	10	*			
141	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.03
142	Tioga Cons., G.	Cal.	10,000,000	100,000	10	*			
143	Tornado Cons. G. S.	Nev.	100,000	100,000	1	*			
144	Tortilita, G. S.	Ariz	1,000,000	100,000	2	*			
145	Tuscarora, S.	Nev.	10,000,000	500,000	100	110,00	Oct.	1881	.1
146	Union Con., G. S.	Nev.	10,000,000	100,000	100	2,185,000	Nov	1887	.50
147	Utah, S.	Nev.	10,000,000	100,000	100	70,000	Dec.	1887	.25
148	Washington, C.	Mich	1,000,000	40,000	25				
149	West Granite Mt., S.	Mon.	5,000,000	500,000	10	*			
150	Zelaya, G. S	C. A.	600,000	300,000	2	*			

G. Gold. S. Silver. L. Lead C. Copper. * Non-assessable. † This company, as the Western, up to Dec. 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in Aug., 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia, $42,390,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, Aug., 1875, the Copper Queen had paid $1,350,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	April 28.		April 30.		May 1.		May 2.		May 3.		May 4.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Alice, Mont	....	.....	....	....	....	....	....	.....	.68	....	.70	.....	1,300
Argenta, Nev.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Atlantic, Mich.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Bassick, Colo.	....	.....	....	....	....	....	11	....	.11	....	....	....	300
Belcher, Nev	....	.....	....	....	....	....	7.75	.....	....	....	....	....	100
Belle Isle, Nev.	....	.....	....	....	....	....	....	.....	.60	....	....	....	200
Bodie Cons., Cal.	2.75	.....	....	....	....	....	....	.....	....	....	....	....	400
Breece, Colo.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Bulwer, Cal	.85	.....	....	....	.82	....	....	.....	....	....	.80	....	1,300
Caledonia, Dak	....	....	....	....	....	....	....	.....	....	....	....	....	.....
Callumet & Hecla	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Catalpa	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Chollar, Nev	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Carysolite, Colo.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Colorado Cent'l, Colo.	....	.....	....	.....	....	....	2 05	*2.00	....	....	....	....	200
Cons. Cal. & Va., Nev.	13.00	12.75	13.88	13.63	14.00	13 88	13 88	....	13.75	13.50	13.63	....	1,000
Crown Point, Nev	....	.....	....	.....	....	....	7.75	.....	....	....	....	....	100
Deadwood, Dak	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Dunkin, Colo.	....	.....	1 10	.....	1.00	....	....	.....	....	....	....	....	200
Eureka Cons., Nev	....	.....	11.00	....	....	....	10.75	.....	10.00	....	....	....	220
Father de Smet, Dak.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Freeland, Colo.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Gould & Curry, Nev.	....	.....	....	....	4.90	....	....	.....	....	....	....	....	100
Grand Prize, Nev.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Green Mountain, Cal.	....	.....	....	....	....	....	....	.....	....	....	....	....	.....
Hale & Norcross, Nev.	....	.....	9.38	....	9 13	....	....	.....	....	....	....	....	200
Holyoke, Idaho	....	.....	....	....	....	....	....	.....	.06	....	....	....	200
Homestake, Dak.	....	.....	11.50	....	11.00	....	11.25	.....	....	....	....	....	270
Horn-Silver, Ut.	....	.....	....	....	....	....	1.00	.....	.90	.88	.86	.85	900
Iron Hill, Dak.	....	.....	....	....	....	....	....	.....	....	....	....	....	100
Iron Silver, Colo.	3 75	.....	....	.....	....	....	....	.....	....	....	....	....	100
Leadville C., Colo.	.26	.....	....	.....	....	....	....	.....	....	....	....	....	100
Little Chief, Colo.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Little Pittsburg, Colo.	....	.....	....	.....	....	....	....	.....	.21	....	....	....	200
Martin White, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Mono, Cal	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Moulton, Mont.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Mount Diablo, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Navajo, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
North Belle Isle, Nev.	6.38	.....	....	.....	....	....	6.00	.....	....	....	5.88	....	270
Ontario, Ut	....	.....	28 50	.....	....	....	....	.....	....	....	28 50	28.00	260
Ophir, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Pewabic, Mich.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Plymouth, Cal.	....	.....	10.00	....	9 50	....	....	.....	10.63	10.50	....	....	1,100
Quicksilver Pref., Cal.	35 75	35.25	35.75	.....	....	.....	35.00	34.25	....	....	....	....	610
" Com., Cal.	11 50	8.25	11.38	11.25	10.60	.....	....	.....	....	....	....	....	2,600
Quincy, Mich.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Ridge, Mich.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Robinson Cons., Colo.	....	.....	....	.....	....	....	....	.....	....	....	.73	.72	600
Savage, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Sierra Nevada, Nev.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Silver King, Ariz.	5.00	.....	5.00	.....	....	....	....	.....	....	....	5.00	....	310
Small Hopes, Colo.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Standard, Cal.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Stormont, Ut.	....	.....	....	.....	....	....	....	.....	....	....	....	....	.....
Yellow Jacket, Nev.	6.88	.....	....	.....	7 63	....	....	.....	....	....	....	....	200

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	April 28.		April 30		May 1.		May 2.		May 3.		May 4.		SALES
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
†Allouez, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Alta, Nev.	2.00	....	....	....	....	....	....	....	....	....	....	....	200
Amador, Cal.	2.30	....	2.30	....	2.35	2.30	2.35	....	2.40	2.35	2.40	2.35	6,200
Am'can Flag, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Barcelona, Nev.	.51	....	.50	....	....	....	....	....	....	.50	.47	....	1,100
Bechtel Con., Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Best & B'licher, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Brunswick, Cal.	....	....	.20	.18	.23	.20	.25	.20	.25	.21	.22	.20	12,300
Bullion, Nev	2.20	....	....	....	2.10	....	2 20	....	2.10	....	2.25	....	950
Carupano, Venez.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cashier, Colo	....	....	....	....	....	....	....	....	....	....	....	....	.....
Castle Creek, Id.	....	....	....	....	....	....	10	....	.10	....	.08	....	2,300
Central Ariz., Ariz.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Cleveland, Dak.	1.65	1.60	1.60	1.55	1.65	1.55	1.55	....	1.65	1.55	1 50	1.20	5,100
Confidence, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	.....
Con. Pacific	....	....	....	....	....	....	....	....	....	....	....	....	.....
Denver City, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Eastern Oregon	....	....	....	....	....	....	....	....	.04	.02	.02	....	5,200
El Cristo, U. S. Col.	2.30	2 20	2.40	2.30	2.30	2.20	2 25	2.20	2.10	....	2.20	2.15	3,400
Excelsior, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Exchequer, Nev.	1 90	....	....	....	1.90	....	1.80	....	1.75	....	1.90	....	800
Found Treas'e, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Hector, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Huron, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Julia, Nev.	.55	....	....	....	.60	....	.60	....	.55	....	.60	....	1,300
Kingst'n & Femb'ke	3 00	2.88	3.50	2.75	3 50	3.25	....	....	3.13	2.88	3.00	....	8,900
Kossuth, Nev.	.18	.15	....	....	.20	.15	.19	.18	.20	.19	.20	.19	2,700
Lacrosse, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Lee Basin, Colo.	....	....	.65	....	....	....	....	....	.70	....	.70	....	800
Mexican, Nev.	....	....	....	....	5.88	....	....	....	....	....	....	....	100
Middle Bar, Cal.	....	....	.47	....	....	....	.40	....	.46	.43	.46	....	1,200
Monitor, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
†National, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Ori'nt'l & Mil'r, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix Lead	....	....	....	....	....	....	....	....	....	....	....	....	.....
Phœnix of Ark.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Potosi, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Proustite, Idaho	1.60	1.50	1.55	1.40	1.45	1.35	1.40	1.35	1.40	1.35	1.40	1.35	6,600
Rappahann'k, Va.	.15	....	.12	....	.13	.12	....	....	.12	....	.13	....	5,400
Red Elephant, Colo.	....	....	....	....	....	....	....	....	....	....	....	....	.....
San Sebastian, S'nS	....	....	....	....	....	....	....	....	....	....	....	....	.....
Santiago, U. S. Col.	....	....	....	....	3.25	....	....	....	....	....	....	....	100
Scorpion, Nev.	.95	....	....	....	.95	....	....	....	....	....	....	....	400
*Security, Colo.	.30	.25	.28	.25	.27	.20	.26	.20	.25	.20	.24	.20	31,550
Silver Cliff, Colo.	....	....	....	....	.08	.05	.09	.08	....	....	.11	.10	6,100
Silver Cord	....	....	....	....	.55	....	....	....	....	....	....	....	500
Silver Hill	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Mg. of L. V.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Silver Queen, Ariz.	....	....	.04	....	.04	....	....	....	.05	....	.04	....	3,900
Sutro Tunnel, Nev.	.20	.19	.21	.20	.20	.19	.18	.16	.19	.11	.2	.16	40,400
Taylor Plumas, Cal.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Tornado, Nev.	....	....	....	....	....	....	....	....	.60	....	50	.40	1,100
Union Cons., Nev.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Utah, Nev.	2 00	....	....	....	....	....	....	....	....	....	....	....	100
Washington, Mich.	....	....	....	....	....	....	....	....	....	....	....	....	.....
Winthrop	....	....	....	....	....	....	....	....	....	....	....	....	.....

†Dealt in at the New York Stock Ex. Unlisted Securities. †Dealt in at the Metal Ex. ‡Assessment unpaid. Dividend shares sold, 13,330. Non-dividend shares sold, 148,400. Total New York, 161,730.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	April 27.		April 28.		April 30.		May 1.		May 2.		May 3.		SALES.
Atlantic, Mich.	.....	.....	18.00	18.00	17.87	17.75	18.00	17.75	18.00	.....	17.50	.....	425
Bodie, Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bonanza D.	1.56	1.50	.....	.....	1 56	1.50	1.62	1.50	1.62	1.25	1.56	1.62	6,284
Boston & Mont., Mont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Breece, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.35	.....	200
Calumet & Hecla, Mich	.....	.....	240	.....	240	.....	240	.....	239	238	.....	.....	92
Catalpa, Colo.	.....	.....	.....	.....	.21	.20	.....	.....	.....	.....	.....	.....	650
Central, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Cal. & Va., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dunkin, Colo.	1.05	1.00	1.07	.....	1.02	.....	1.00	.95	.95	.92½	.95	.90	2,550
Enterprise.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Eureka, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Franklin, Mich.	15.00	14.50	15.00	.....	15.37	15.25	15.50	.....	15.50	15.00	15.25	15.00	1,109
Freeland, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hale & Norcross.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine, Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ironton Iron Co., Mich	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Chief, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Little Pittsburg, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Martin White, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Napa, Cal.	1.75	.....	1.75	.....	.....	.....	1.75	.....	1.75	.....	.....	.....	500
Osceola, Mich.	21.50	.....	21.50	.....	23.00	21.50	23.00	.....	23.00	.....	22.00	.....	280
Pewabic, Mich.	.....	.....	.....	.....	.....	.....	2.75	.....	.....	.....	.....	.....	100
Quincy, Mich.	70.00	.....	71.00	70.50	72.50	72.00	72.50	72.00	72.50	.....	71.00	70.00	335
Ridge, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Robinson, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sierra Nev., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver King, Ariz.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Standard, Cal.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tamarack, Mich.	150	.....	150	.....	150½	150	150	.....	151	.....	.....	.....	132

NAME OF COMPANY.	April 27.		April 28.		April 30.		May 1.		May 2.		May 3.		SALES.
Allouez, Mich.	1.75	1.62	1.75	.....	1.75	.....	1.75	.....	1.62	.....	1.62	.....	1,400
Arnold, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Aztec, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston & Mont.	44.00	44 00	44 50	44 00	45.38	45.00	45.25	.....	44.06	43.00	.....	.....	960
Bowman	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brunswick, Cal.	.21	.....	.....	.....	.....	.....	.20	.....	.25	.....	.....	.....	600
Crescent, Colo.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cusi, N. Mex.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
El Cristo, U.S. Col	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Everett	.21	.....	.25	.....	.25	.....	.25	.....	.....	.....	.25	.....	900
Hanover, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Honorine	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Humboldt, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hungarian, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Huron, Mich.	4.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.25	.....	200
Kearsarge, Mich.	7.25	.....	7.00	.....	7.00	.....	7.00	.....	7.00	6.87	7.00	.....	375
Mesnard	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
National, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Native, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oriental & M., Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rappahannock, Va.	.17	.....	.....	.....	.17	.....	.....	.....	.....	.....	.14	.....	1,300
Royal, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Security, Colo.	.25	.....	.25	.....	.25	.....	.27	.25	.25	.....	.25	.24	3,500
South Side, Mich.	.....	.....	.....	.....	.....	.....	.25	.....	.25	.....	.....	.....	300
St. Louis, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Mary's	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sutro Tunnel, Nev.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Taylor Plumas, Cal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington, Mich.	.25	.....	.....	.....	.....	.....	.25	.....	.....	.....	.....	.....	300
Winthrop, Mich.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Ex dividend. Boston: Dividend shares sold, 12,717. Non-dividend shares sold, 9,835. Total Boston, 22,552.

COAL STOCKS.

NAME OF COMPANY.	Par val. of sh'rs.	Apr. 28.		Apr. 30.		May 1.		May 2.		May 3.		May 4		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Cameron Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ches. & O. RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	1½	.....	.....	.....	100
Chic. & Ind. Coal RR.	100	.....	.....	90½	.....	90	.....	.....	.....	.....	.....	.....	.....	200
Do. pref.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Col. & Hocking Coal	100	23¼	23	23½	22⅞	23½	23¼	23	.....	23¼	23	23	.....	2,040
Col., C. & I	100	37½	.....	38½	37⅝	38¼	37½	37¾	37	36⅞	36¾	36¼	.....	3,320
Consol. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & H. C.	100	109¾	109½	110	109½	110⅛	109¼	109¾	109¾	109⅝	109⅛	109¾	109	2,673
D., L. & W. RR.	50	131½	130⅞	131¾	131¼	132	131¼	131⅞	130⅜	131	129½	130⅞	129⅞	118,175
Hocking Valley	100	.....	.....	22	.....	.....	.....	.....	.....	.....	.....	21	20¼	250
Hunt. & Broad Top	.....	16¾	16⅛	17	16⅞	.....	.....	.....	.....	16¾	.....	.....	.....	800
Do. pref.	.....	39¾	39¼	39⅞	39½	.....	.....	39½	.....	39	.....	.....	.....	2,075
Lehigh C. & N.	50	.....	.....	50	49¾	50	49¾	49¾	.....	49½	.....	.....	.....	487
Lehigh Valley RR.	50	53	52¾	53	.....	53	.....	53	52¾	52⅞	52¾	.....	.....	1,313
L. & W. C. & I. Co	.....	17½	.....	17	.....	.....	.....	.....	.....	.....	.....	.....	.....	200
Mahoning Coal RR.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Marshall Con. Coal	100	10	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	200
Maryland Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Montauk Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Morris & Essex	100	.....	.....	.....	.....	140	.....	141	.....	.....	.....	140⅞	.....	239
New Central Coal	100	10½	.....	10½	.....	10¾	10½	11⅛	.....	.....	.....	.....	.....	350
N. J. C. RR.	50	84	83½	84⅝	83⅜	84¼	83⅞	83⅞	83⅜	83¼	83	.....	.....	9,636
N. Y. & S. Coal	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Y., Susq. & Western	100	9¾	9	9¾	9⅛	9⅛	9¼	.....	.....	9	.....	8⅞	.....	1,325
Do. pref.	100	32	31¼	32⅝	31⅞	31⅝	31⅝	.....	.....	31⅛	30¾	31⅛	30½	5,580
N. Y. & Perry C. & I.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Western R.R.	100	18½	.....	19½	18	19½	19¼	19½	19¼	19½	19¼	19¼	.....	1,794
Do. pref.	50	47⅞	47⅛	48⅞	48⅛	50	48½	48⅞	47¾	48⅛	47¾	48⅛	48	21,957
Penn. Coal	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. RR.	50	55½	55⅜	55¾	55⅛	55⅛	*53½	55⅝	55⅜	53½	53⅜	.....	.....	7,211
Ph. & R. RR.**	50	63⅛	62⅞	64¾	63¾	64½	63⅝	64⅛	62⅝	63¼	62	63	62⅜	397,307
Tennessee C. & I. Co.	100	29⅞	29½	30	28½	.....	.....	.....	.....	.....	.....	27½	.....	2,800
Westmoreland Coal	100	.....	.....	.....	.....	67	.....	.....	.....	.....	.....	.....	.....	4
Whitebreast Fuel Co.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Ex-dividend.
**Of the sales of this stock, 93,557 were in Philadelphia, and 303,750 in New York. Total sales, 580,036.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS. April 27.	April 28.	April 30.	May 1.	May 2.	May 3.
Alpha	.....	.....	.....	.....	.....	.....
Alta	1.80	.....	.....	1.90	1.90	1.90
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.55	.....	.....
Best & Bel.	4.95	4.80	4.80	5.00	4.90	5.00
Bodie	2.85	2.70	2.70	2.70	2.70	2.65
Bulwer	.....	.85	.85	.....	.80	.75
Chollar	5.00	4.90	4.90	5.12½	.....	5.22
C'm'weal'h	.....	.....	.....	.....	.....	.....
Con. C. & V	12.50	12.62½	12.62½	13.62½	13.00	13.13
Con. Pac.	.....	.....	.....	.....	.....	.....
Crown Pt.	5.12½	5.37½	5.37½	7.62½	7.00	6.87½
Eureka C.	.....	10.75	10.75	.....	10.50	10.50
Gould & C.	4.75	4.55	4.55	4.75	4.70	4.80
Grd. Prize.	2.55	.....	.....	2.25	2.15	.....
Hale & N.	8.87½	8.75	8.75	9.00	9.12½	8.87½
Mexican	4.90	.....	4.80	5.37½	5.00	4.90
Mono	1.90	1.80	1.80	1.80	1.75	1.75
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	.....	1.75	1.75	1.70	1.75	1.70
Nev. Queen	.....	.....	.....	.....	4.00	.....
N. Belle I.	.....	.....	.....	5.87½	5.75	.....
Ophir	8.62½	8.50	8.50	9.12½	8.88	8.88
Potosi	4.15	4.05	4.05	4.45	4.70	4.70
Savage	5.12½	5.25	5.25	5.62½	5.50	5.50
Scorpion	.....	.....	.....	.....	.....	.....
Sierra Nev	4.10	4.05	4.05	4.35	4.30	4.40
Sutro Tun.	.....	.....	.....	.....	.....	.....
Tip Top	.....	.....	.....	.....	.....	.....
Union Con.	3.85	4.00	4.00	.....	4.10	4.25
Utah	1.80	1.85	1.85	1.95	1.85	1.85
Yellow Jkt.	6.62½	6.62½	6.62½	7.25	7.00	6.88

Pittsburg. May 3.

[From our Special Correspondent.]

The course of the iron trade market during the past week presents no unusual feature. Values show but little change. In some instances prices have been shaded a trifle; but in canvassing the market we find that there has been a more active inquiry, particularly for certain descriptions. We learn of several lots that parties have under consideration that may be closed in time for our next report. Certain transactions, no doubt, have been held back to receive the benefit of a reduction in freights, that we announced was coming in the course of a few days. Notwithstanding the fact that prices are low and producers claim scarcely cover actual cost, consumers are not disposed to anticipate future wants; on the contrary, many of them are disposed to carry no more stock than they can possibly help. A large number of furnaces are still banked or out of blast; still there is no deficiency in the supply. In conversation with the owner of one of the furnaces that has been "banked" since the first of the present year, he remarked that the starting up or blowing in of his furnace rested with the men altogether. With iron selling at present prices it was out of the question to pay the old wages, and only a reduction in the cost of making iron would induce him to make it. We have no doubt there are other furnace men who view the matter in the same light. The labor troubles continue at various points and do not seem nearer a settlement than they did last week. Both parties are on their mettle and seem disposed to "fight it out on that line if it takes the balance of the year." A careful examination shows that most descriptions of raw iron can be bought at Pittsburg at lower prices than given in any other market. The published sales prove this beyond all doubt. The coke muddle still continues, with prices down to an extremely low figure.

Iron Ore.—Last week we reported a sale of 7000 tons Bessemer Lake ore on dock at Cleveland. We hear of an additional sale of 6000 tons same description $5.75 per ton cash.

We are reported the following sales:

Coke and Coal Smelted Lake Ore.

1000 Tons Imported Bessemer delivered	22.15 cash.
1000 Tons Bessemer	16.50 cash.
600 Tons Gray Forge	15.00 cash
630 Tons Bessemer	16 85 cash.
200 Tons Foundry	16.00 cash.
100 Tons No. 2 Foundry	16.50 cash.
100 Tons No 1 Foundry	17.50 cash.
100 Tons Close Gray	14.75 cash.
50 Tons Foundry	17 00 cash.
50 Tons Silvery	16 50 cash.
50 Tons No. 1 Foundry, all Ore	17.25 cash.
50 Tons Gray Forge	15.00 cash.

Coke, Native Ore.

1000 Tons Gray Forge	15 00 cash.
40 Tons No. 1 Foundry	17.50 cash.
25 Tons No. 1 Mill	15.50 cash.
20 Tons No. 2 Foundry	16.25 cash.
20 Tons No. 1 Foundry	17.35 cash.
20 Tons No. 1 Foundry	17.60 cash.

Charcoal.

100 Tons Hot Blast, off Grade	22.00 cash

Steel Slabs and Billets.

1500 Tons Nail Slabs	28.00 cash.
1500 Tons Billets Delivered	28.75 cash.

Muck Bar.

500 Tons Good Neutral May	27 00 cash.
500 Tons Good Neutral May	27.00 cash.

Steel Wire Rods.

500 Tons American	42.50 cash.

Old Iron Rails.

450 Tons American T's	22.50 cash.
200 Tons American T's	23.00 cash.

Scrap Material.

250 Tons Railroad Cast Scrap, gross	16.50 4 mo.
150 Tons Car Wheels, gross	18.50 cash.
100 Tons No. 1 Railroad Scrap, net	20.00 cash.
100 Tons No. 1 Wrought Scrap, net	19.50 cash.
100 Tons No. 2 Wrought Scrap, net	18.50 cash.
100 Tons Cast Borings, gross	12.50 cash.

The Youngstown Freight Committee held an important meeting in the Lake Shore office in Pittsburg on the 2d inst. Representatives were present from the Pittsburg & Western, Pittsburg & Lake Erie, Lake Shore & Michigan Southern, Nypano, Pennsylvania Company and Baltimore & Ohio Railroads. Several iron manufacturers and furnace owners were present with protests and the following reductions in rates from the Mahoning and Shenango valleys to Pittsburg were made: For pig iron, from 85 to 75 cents; for mill cinder, from 70 to 65 cents; for billets, blooms and scrap iron, from $1 to 85 cents. The Pittsburg Freight Committee were to meet on the 3d inst., and make other rates.

Philadelphia. May 4.

[From our Special Correspondent.]

The declining tendency in nearly all branches of the iron trade still continues, but it is more particularly noticeable in pig-iron than elsewhere. Business is light. The three railroad companies have not yet concluded as to the question of lower rates. The Lehigh Valley showed a yielding spirit, but the Pennsylvania and the Reading companies have not, up to this hour, given positive assurance one way or the other. A strong pressure has been brought to bear on both fuel and transportation interests, and the furnace interests are not without hope that remedial measures will be taken to reduce cost of production. Sales since Monday have shown an indifference on both sides. Two or three companies have withdrawn from the market. Eastern buyers are not willing to place future orders at any fixed price. Forge iron is quiet. Southern has been offered at $16; No. 2 at $17 and No. 1 at $18, but consumers who have been asked why they do not cover at these low figures, say they have no desire to experiment. Negotiations are hanging fire for more or less forge and foundry, but there is no guessing what the result will be. There are probabilities of an active summer demand.

Muck bars have been active. Anthracite and charcoal bloom orders have been dropping in. Foreign material is asked for, but no sales are reported. Merchant bar-iron is dull, and as there is no room for the slightest shading mill men have nothing to do but lay off furnaces. Some few mills are piling up some of the ordinary sizes of iron. Nails are moving well, but not fast enough to create hopes of better prices. Sheet iron makers have more capacity than business.

Merchant steel is dull. An occasional large plate iron order is booked at 2c. Car and locomotive works orders are helping the trade along through a dull time. Structural iron orders foot up well in the aggregate. Skelp is weak and dull, and orders for pipe are few and small. Steel rails are quiet at usual rates and prospects have not improved. Old rails are dull. But little stock is offered. Some brokers are holding for high figures. Scrap yards are only doing a light business at even prices for all except choice lots.

FINANCIAL.

NEW YORK, Friday Evening, May 4.

The mining share market continues the dull and featureless condition shown during the past few months. An active market in the near future is expected; but so far there are few signs that this will materialize.

Mr. Frederick Prentice, as the owner of 1700 shares of stock of the Big Pittsburg Consolidated Silver Mining Company, applied to Judge O'Brien, in Supreme Court Chambers, on the 3d inst. for the dissolution of the company. Judge O'Brien appointed Edward Earle receiver and required him to furnish a bond of $5000.

The Hollywood Mining Company, of California, has made application to have its stock listed at the Consolidated Stock and Petroleum Exchange. The company was incorporated under the laws of California, May 28th, 1887, with a capital stock of $200,000; shares, $2 each, assessable. The company owns the Merrimac and Elephantine lodes. The officers are Martin Jones, president; C. M. St. John, secretary; John F. Minear, superintendent. The directors are Jas. R. Bickets, Martin Jones, Warren Holt, John Henderson, F. C. Masetrich. Mr. E. P. Minear, of "Middle Bar and Amador" fame, is the manager.

There was considerable activity in Brunswick, which advanced from 18 to 25c., with sales of 12,300 shares, the price to-day ruled at from 20 to 22c.

The Quicksilver stocks were active only in the beginning of the week, when Preferred sold at from $35.25 to $35.75, closing at $34.25. Common sold at from $8.25 to $11.50.

We are officially advised by the officers of the company that the fire in the Plymouth Consolidated Company's mine is believed to be out; but to make doubly sure they will not open it before the latter part of this month. Little has been doing in the stock, which shows sales of 1100 shares at prices ranging from $9.50 to $10.63.

Bodie shows only one sale at $2.75; Bulwer a few at from 85 to 80c.; Standard and Mono were neglected.

Amador continues at from $2.30@$2.40. Middle Bar opened at 47c., declined later to 40c., and advanced again to 46c. The promoters of these stocks are about to float another stock—the Hollywood, referred to above—and it is probable that in consequence the Twin Brothers will be neglected, and lower prices will then be in order.

Cleveland Tin continued to hold its own at from $1.55@$1.65 all the week until to-day, when the price declined to $1.20, in consequence, it is said, of the decline in the tin market. How this could affect the stock is not quite clear, since the company is not a producer of tin, and many doubt if it ever will be. The sales amounted to only 5100 shares.

Homestake was the only Dakota stock dealt in. A few sales are recorded at from $11 to $11.50.

The price of Silver King remains at $5.

The price of Rappahannock has not yet revived, and still rules at 12@13c.

Western papers state Messrs. Mackay & Fair will retire from the management of the north-end Comstock mines and relinquish the control to D. O. Mills and the Jones and Newlands party, who are represented as desirous to control the Consolidated California & Virginia mine to prevent the discontinuance of ore shipments to the Carson River mills or the operating of any more mills on the lode by water power, which would seriously curtail the revenue of the Virginia & Truckee Railroad now derived from the transportation of ore and the supplying of wood for operating steam stamp mills.

Another more hopeful view of the case is that Messrs. Mackay & Fair, having decided to withdraw from the Nevada bank management, will now devote their attention exclusively to their mining interests, and that an important revival of business on the lode and a boom in share values will be the result. Little is doing in this market in the Comstock shares. Consolidated California & Virginia continues to sell at from $12.75 to $14. The prices of the other stocks show little change. Hale & Norcross has declared a dividend, the first since April, 1871—seventeen years ago. This announcement has not affected the price of the stock, which has been selling at from $9.13 to $9.38. Sutro Tunnel shows the largest business on the list, the transactions amounting to 40,400 shares. The price declined from 20 to 11c. yesterday, but to-day advanced to 20c.

Next to Sutro Tunnel, Security was the most active stock on the list, the sales amounting to 31,550 shares. The price declined from 30 to 20c. Our Boston correspondent states that an assessment is talked of. Silver Cord shows one transaction at 55c. Lee Basin was a little higher, going from 65 to 70c.

Robinson Consolidated was only dealt in to-day and sold at from 72 to 73c. The same may be said of Little Pittsburg, which shows one sale to-day at 21c. Leadville is quoted at 26c. and Iron Silver at $3.75. Dunkin at from $1 to $1.10. Colorado Central at from $2 to $2.05 and Bassick at 11c.

Castle Creek is quiet at 8@10c. and Holyoke at 6c. Proustite was again quite active, but shows a further decline; the price opened at $1.60 and closed to-day at $1.35.

Horn-Silver shows transactions of 900 shares at declining prices, going from $1@85c. Ontario continues to hold its price at from $28@$28.50.

El Cristo shows a further decline, going from $2.40 @$2.10, selling at from $2.15@$2.20. The stock shows daily transactions, but the total sales amounted only to 3400 shares.

Kingston & Pembrook is beginning to attract attention, some 8900 shares changing hands at prices ranging from $2.88 to $3.50.

Dividends.

Boston & Colorado Smelting Company has declared an extra dividend of three per cent, or $30,000, payable April 28th.

Bridgewater Natural Gas Company, of Pennsylvania, has declared a dividend, No. 26, of one per cent, payable April 30th in Pittsburg.

Eastern Development Company, of Nova Scotia, will pay interest coupon No. 5 at the American Loan and Trust Company, Boston, on and after May 1st.

Hale & Norcross Mining Company of Nevada, has declared a dividend of fifty cents a share, or $56,000, payable May 15th, at San Francisco.

Marshall Consolidated Coal Mining Company of Colorado will pay the first mortgage bonds and coupons due May 1st at the Farmers' Loan and Trust Company, No. 22 William street, New York City.

North Belle Isle Mining Company, of Nevada, has declared a dividend (No. 6) of fifty cents per share, or $50,000, payable May 7th, at San Francisco.

The Chicago & Indiana Coal Railway has declared a quarterly dividend of one and one half per cent on preferred stock, payable June 1st.

Westinghouse Electric Company has declared a dividend (No. 1) of one and a half per cent, payable May 25th, in Pittsburg.

Whitebreast Fuel Company, of Iowa, has declared a quarterly dividend of one and three quarters per cent, payable April 26th.

Wyoming Valley Coal Company, of Pennsylvania, has declared a quarterly dividend of one per cent, payable May 10th.

Assessments.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am'nt per share.
Anna, Dak	1	Apr. 10	May 10	June 1	.001
Anchor, Utah	..	Mar. 3	May 5	May 26	.10
Baltimore, Nev	1	Apr. 16	May 21	June 8	.25
Belcher, Nev	34	Mar. 13	Apr. 17	May 7	.50
Crown Point, Nev	49	Apr. 13	May 16	June 6	.50
Day, Nev	16	Feb. 8	Apr. 9	May 7	1.00
Equitable, Utah	33	Feb. 14	Mar. 30	May 9	.15
Enterprise M. & M.	1	Apr. 3	May 4	May 19	.15
Gould & Curry, Nev.	58	Mar. 12	Apr. 15	May 10	.50
Homeward B'd, Dak.	5	Mar. 24	May 26	June21	.001
Himalaya, Utah	3	Apr. 26	May 26	June26	.005
Idaho, Idaho	..	Mar. 15	Apr. 20	May 10	.40
K. of the West, Ida.	3	Apr. 21	May 24	June16	.15
Mayflower, Cal	41	Apr. 9	May 10	June 4	.25
Navajo, Nev	19	Apr. 12	May 17	June 7	.30
Oxford, Dak	2	Apr. 9	May 9	May 25	.005
Paradise Valley, Nev.	5	Apr. 21	May 29	June18	.15
Peerless, Ariz	11	Apr. 4	May 7	May 28	.25
Quincy, Dak	3	Mar. 3	May 2	May 25	.02½
Rattler-Gilroy, Dak.	11	Apr. 7	May 7	May 31	.02
Sierra Nevada, Nev.	91	Apr. 3	May 8	May 28	.25
Silver Mint, Dak	1	Apr. 3	May 5	May 23	.01
Spanish, Cal	2	Jan. 4	Mar. 10	June 2	.04
South End, Nev.	..	Apr. 4	May 7	May 23	.10
Trojan, Nev	17	Mar. 27	May 4	May 28	.10

Meetings.

The annual and special meetings of the following companies will be held on the dates given:

Barclay Coal Company, No. 146 South Fourth street, Philadelphia, Pa., May 7th, at twelve o'clock noon.

Carupano Mining Company, No. 53 Broadway, New York City, May 7th.

Little Annie Gold Mining Company, No. 145 Broadway, New York City, May 10, at twelve o'clock noon.

Milwaukee Iron Mining Company, office of Harvey H. Brown, Cleveland, Ohio, May 30th, at eleven o'clock A.M.

Pacific Coal and Coke Company, Room 27, Tabor Block, Denver, Colo., June 5th, at three o'clock P.M. Special meeting to consider a proposition to increase the capital stock to $1,000,000; to issue first mortgage bonds for $500,000, and to change the place of business to Colorado Springs, Colo.

Santa Rica Copper and Iron Company, No. 4 Bridge street, New York City, May 9th, at eleven o'clock A.M.

Virginia, Tennessee and Carolina Steel and Iron