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CONTENTS.

PLACER MINING IN MONTANA.

From nearly every part of the state of Montana is received news of renewed activity in placer mining. For the past two or three years the rainfall in this region has not been over-large, and the heavy snows of the last winter will prove a regular Godsend to all interested in this branch of mining, which, so far, with few exceptions, has been prosecuted in this state in rather a primitive manner, few efforts having been made either to store water or to work many of the extensive gravel deposits which exist, by some of the improved methods practised in California.

We have no definite statistics of the production of placer gold in Montana, but there is no doubt whatever that it has been steadily decreasing during the past three years, the receipts reported at the various branches of the mint having been notably less in 1890 than in 1889, and considerably smaller in the latter year than in the preceding.

The reason for this falling off is partly explained by the fact that the yield of gold from the auriferous gravel is steadily diminishing, as is to be expected. Still, there is not yet any lack of good placer ground in Montana, and the principal reason for the decline of the industry since 1887 has been the insufficiency of water supply.

The mining industry of Montana, like that of California and Colorado, received its impetus from placer mining, and much of the rapid growth of the state is due to the richness of the placers first worked in the vicinity of Bannack and Helena in 1863. The state has proved so rich in other minerals, however, that attention was diverted from the placer diggings, and these were never worked on the same extensive scale as those of California.

There is quite a tendency noticeable at the present time, however, to develop these properties more extensively and on a more systematic scale, a comparatively large number of companies making preparations for work during the coming summer. Results equal to those obtained in the past from the famous diggings in Prickly Pear and Last Chance gulches, in Lewis and Clarke county, or Alder Gulch, in Madison county, cannot, of course, be expected at the present time, but there are thousands of acres of unworked placer areas in the state which in point of richness compare favorably with those of California in former days, and which are well situated with reference to water supply and dumping ground for tailings. There is no doubt that many of these enterprises will obtain substantial yields. A point of great importance in connection with placer mining in Montana is the fact that there is little danger to be apprehended from interference with agricultural interests.

THE MINERAL PRODUCTION OF CANADA IN 1890.

In another column we print a statement of the mineral production of the Dominion of Canada in 1890, issued by the Canadian Geological Survey under date of April 7th, which is of particular interest at the present time in view of the proposed laws affecting the mining industry of the provinces of Quebec and Ontario, which are now exciting such a storm throughout the Dominion. The promptness with which this report is issued is commendable, adding largely to its value as well as reflecting credit upon the Bureau to which its preparation was intrusted. The present report is preliminary and subject to revision in the full report which is to follow, the quantity and value of certain mineral products being estimated. These, however, are few in number, and, comprising for the most part structural materials, do not invalidate a comparison of the output of the most important minerals produced in Canada with that of preceding years.

The total value of the mineral products of Canada in 1890 was, in round numbers, $19,000,000, which was a slight falling off from 1889, when it was $19,500,000, but still a decided increase over the output of 1888, which was valued at $16,500,000. About 65 per cent. of the total product of 1890 was represented by the seven substances which constitute the principal mineral wealth of the Dominion. The value of the coal produced formed 33·6 per cent. of the total; gold, 6·1 per cent.; asbestos, 5·4 per cent.; nickel, 5·3 per cent.; copper, 5·1 per cent.; building stone, 4·9 per cent.; and petroleum, 4·7 per cent.

The increase in the coal production was very marked, amounting to more than $800,000, which was a gain of about 14½ per cent. on the total of 1889. Another striking increase was made in the output of an especially Canadian product—asbestos—the value of which jumped from only $426,554 in 1889 to $1,039,661 in 1890. This was mainly due to the increase in the price of the mineral, which, on certain grades, rose fully 100 per cent. during the year, stimulating the industry so that several new mines were opened and the old ones worked with renewed vigor. Another marked increase was made in the case of a minor product—mica—which is, nevertheless, of much importance in view of the extent to which it is used by the manufacturing electrical companies. In 1889 the production of mica in Canada was valued at only $28,718; while in 1890 it increased to $68,074. The Canadian "amber mica" is highly valued for electrical purposes on account of its flexibility and excellent insulating qualities, and is imported into this country in considerable quantities. Of greatest interest, however, are the nickel statistics, which show an output of nickel in matte from the Sudbury mines, amounting to 1,336,627 pounds, valued at $1,002,470. The amount of this metal produced in 1889 was not stated, the returns to the Survey from the one company producing at that time being confidential.

In the case of the precious metals, there is a slight falling off in the production of gold and a small increase in the production of silver. The decrease in the output of gold is undoubtedly due to the exhaustion of the more easily worked placer deposits of British Columbia. It is to be expected that the production of both the precious metals will increase rapidly when the rich mineral resources of this province are more extensively developed. A large amount of prospecting work is now being done in the Kootanie country and other districts of British Columbia with very promising results, but the region is so little opened that developments are slow. The government of British Columbia, however, with commendable efforts, which contrast strongly with the policy of the Eastern provinces, which are enacting laws so seriously affecting the mining industry, is doing all in its power to assist mining operations in that country.

On the whole, the mining industry of the Dominion does not seem to

have fulfilled, during the past year, the promise that it gave at the beginning. Had it not been for the increase in coal, asbestos and nickel, the total production would have shown a marked decrease from that of the preceding year. The Dominion of Canada is undoubtedly extremely rich in minerals. The country, however, is of vast extent, sparsely settled, and has such great areas with no transportation facilities that its development must of necessity be slow. The governments of the Eastern provinces should unite in fostering their mining industry rather than passing laws which cannot fail to injure it.

FIRE-PROOF MILL CONSTRUCTION.

Of interest at the present time, when the question of the prevention of fire in our large cities is a matter of so much discussion, leading to proposed changes in our building laws, is the development of methods of construction of buildings used for manufacturing purposes, with a view of rendering them fire-proof, or, rather, reducing the danger of loss by fire. In our issue of April 4th we gave a description of the system of slow-burning mill construction which was gradually evolved, largely through the labor and study of Messrs. C. J. H. WOODBURY and EDWARD ATKINSON, of Boston, from experiments instituted by the manufacturers' mutual insurance associations of New England. It is in the latter section of the country only, where so much attention has been given to the subject, that this method of construction has been generally adopted up to the present time, although, as its advantages are becoming better appreciated, its principles are being embodied to a greater and greater extent in the erection of mill buildings in other parts of the United States. The advantages which this system offers over the old types of mill architecture are so obvious, however, that it is surprising that, even now, its methods are not more widely used. The system of slow-burning mill construction is simply a codification of engineering experience, both in fires and in construction, at the same time reducing danger of fire and affording greater facilities in methods of building for manufacturing purposes.

As finally developed, the system of slow-burning mill construction is distinctly American, differing radically from the type of fire-proof mill construction adopted in England, where the methods of mill architecture have also been undergoing a gradual evolution in recent years, but on quite different lines, due primarily to the difference in conditions. The development of the two systems was ably traced by Mr. JOHN R. FREEMAN in a paper read, last autumn, before the Boston Society of Engineers.

In the United States the effort to avoid fire has been directed toward making the structure safe without increasing the cost. Wood was comparatively cheap here, and iron dear, and thus being compelled to use timber for pillars, floor and roof, the study was to so shape and place this combustible material that it should be under the least favorable conditions for combustion.

While the attempts in this country were thus directed toward making the mill "slow burning" only, the English mill architect set out to make it absolutely fire-proof, using nothing in its construction but iron, brick, masonry or other incombustible material. In the modern English mill of this design, all floors are composed of brick arches or concrete masonry carried by iron floor beams, and supported by cast-iron pillars, although of late an innovation has been introduced in the use of concrete floors, which are claimed to be equally safe and cheaper. The inner face of the walls and the top of the rooms are surfaces of bare masonry, and the only woodwork to be found in some of these structures is the window sash; but in general it is customary to lay a light flooring of thin boards, as being more comfortable to the feet of the operatives.

This type of construction is not new, having been in use in England in isolated cases for many years. It has been during the past ten years only, however, that its practice has become universal, its high cost having been against it. Within the past year an approach has been made in this country toward the English system by the use, in some mills constructed upon the general slow-burning principle, of floors laid with concrete or hollow tiling. The standard construction, however, remains timber, which is now frequently made fire-proof by covering the under side of the plank and exposed faces of beams with a "wire lath," plastered in the ordinary manner, wooden pillars being similarly protected. This last development of the slow-burning system is known as the fire-proof construction.

Concerning the relative merits of the English and American systems of standard mill construction, aside from the question of cost, there is room for argument. The English mill undoubtedly has the advantage in freedom from vibration due to the great weight and inertia of its floors. Whether it is actually safer against fire is, however, problematical. Whether any building is fire-proof or not, is merely a question of the intensity of the fire, the term being so far relative, and the vital point the amount of combustible material contained in the structure. The weak point in the English construction is the arched brick floors on iron beams; and the repeated failures of buildings of this class, both in England and America, where this general design is followed in the modern office buildings erected in our cities, lead one to doubt their enduring qualities under a severe test. After a careful consideration of the merits of the two systems, Mr. FREEMAN states that he is strongly of the opinion that the American slow-burning mill, unprotected by plastering but equipped with sprinklers, is the safer of the two. Other engineers who have made special study of this subject have expressed themselves as being of the same conviction.

The slow-burning system of construction has not as yet been introduced to any extent in city architecture and does not indeed seem to be generally adapted to this class of work, although there is undoubtedly a field for the use of the fire-proof construction protected by plastering in the erection of cheaper office buildings and warehouses. Its general introduction in cities is rendered impossible, however, on account of the demand for display and widely connected spaces, particularly in connection with the various branches of the retail trade. The essentials to be observed for the diminution of the fire hazard in the design of the ordinary type of building erected in our cities, seem to be the limitation of their height, the maintenance of division fire walls, and the proper arrangement of roofs, cornices and roof windows.

BOOKS RECEIVED.

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

Bulletin of the United States Fish Commission. Vol. VIII, for 1888. Washington, 1890.

Resources of Arkansas. First Biennial Report from the Bureau of Mines, Manufactures and Agriculture of the State of Arkansas, for 1889 and 1890. By M. F. Locke.

Seventh Annual Report of the Inspector of Mines of the State of Kentucky Frankfort, Kentucky. 1890.

The Iron Ores of Minnesota. Their geology, discovery, development, qualities, and origin, and comparison with those of other iron districts; with a geological map, 26 figures and 44 plates. By N. H. Winchell and H. V. Winchell. 430 pages. Minneapolis, 1891.

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.

The Production of Oxygen from Bleaching Powder.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Dr. W. Simons writes in the ENGINEERING AND MINING JOURNAL of March 28 that the production of pure oxygen gas from bleaching powder is a well known fact, and refers to a "Leidmann process." He has reference, no doubt, to Dr. Theodore Fleitmann, the well known manufacturer of cobalt and nickel in Germany, in whose works I was engaged as chemist some nine or ten years. It was there that the first observation of the production of oxygen gas from bleaching powder, in precipitating and separating cobalt sesquioxide from nickel solution, was made. My investigation of the reaction and the pureness of gas followed much later. I had reserved it for convenient publication and was not aware that it had already been published, as everything appertaining to the manufacture of cobalt and nickel has been guarded as a secret.

DEADWOOD, S. D., April 1, 1891. WERNER LANGGUTH.

Interesting Occurrences of Gold.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mr. Hausmann in his account of "Interesting Occurrences of Gold," in your last issue of the JOURNAL, asks "Are similar occurrences of gold known in the United States or elsewhere?"

I have seen a somewhat similar occurrence at Cana, in the Darien mine, Rpeublic of Colombia. The mine is situated at an altitude of 1,900 feet above sea level, in a country rock, like that of Cerros Island, belonging to the basic igneous group.

It is a porphyrite (felspar porphyry) carrying iron pyrites as an accessory ingredient, and it weathers and kaolinizes into highly colored clays merging gradually into harder rock as at Cerros Island.

The gold occurs in a true fissure, and associated with iron and copper pyrites, zinc blende and galena, in a gangue of porphyrite seamed with veinlets of calcite and quartz. The principal ore body thus far developed is lenticular in section, 20 to 30 feet wide, and 150 feet long, and the gold occurs mostly free and often visible to the naked eye.

Specks and fine wires of free gold imbedded in cubes of galena or pyrites are frequently found.

In the richer portions of the vein telluride is often associated with the native gold, which occurs in nuggets in size from that of fine bird shot up to buck shot and occasionally even larger. These grains of gold are not welded together, but detached, and all show more or less perfect crystallization in the octahedron or its modifications, and where the crystals are well defined the gold has a most brilliant lustre.

I have not observed the rhomboidal form, but wire gold is sometimes found, though it does not show the rectangular section or fluted sides that Mr. Hausmann describes in the Breckenridge gold. I have, however, seen beautiful specimens of the same fine wire and moss gold he speaks of, from a district about 50 miles northwest of Cana.

Aside from the main "Mina del Norte" vein at Cana, there are numerous small veins, as at Cerros Island, rich in gold at the surface, and the districts are much alike in the similarity of the country rock, though the gold is coarser and more crystallized at Cana than at the latter place.

NEW YORK, May 6, 1891. THOS. H. LEGGETT.

METHODS OF QUARRYING, CUTTING AND POLISHING GRANITE.*

By Wm. C. Day.

Granite quarries are nearly always started in natural outcroppings of the ledge, but as they are entirely open workings and necessarily cover large areas, considerable development work is needed at first and from time to time, as the quarry is enlarged, in stripping or clearing away the timber and soil and in removing the weathered portions or cap rock.

Owing to great diversity in the structure of the rocks classed as granite the operations of quarrying, the object of which is the removal of large rectangular blocks in the quickest and most economical manner, necessarily vary considerably, even in different openings of the same region. Ordinarily, to break the rock into sizes which can be handled, blasting is necessary. In doing this the object is to direct the force of the powder so that it may break the rock in the desired direction without shattering either the piece removed or the standing rock, but it can be successful only when it is detached at the ends and bottom and has a chance to move out in front. As the rift, or the direction of easiest cleavage in the rock, in the majority of quarries approaches the horizontal the first breaks are obviously made either with or across the grain. The method most generally used for doing this is called "lewising," from the shape of the blast hole. A lewis hole is made by drilling close together holes about an inch and a half in diameter and in breaking down the partition between them by means of a flat steel bar, called a "set." This wide hole determines the direction of the required fracture. A "complex" lewis hole is the combination of three ordinary drill holes; a "compound" one, of four; but the latter is seldom used, for if a very long break is to be made a series of lewis holes is drilled at considerable distances apart, and after being charged are fired simultaneously by means of an electric battery.

Another process occasionally used in a few quarries is as follows. A single round hole having been drilled, the explosive is put in, and on top of it an inverted iron wedge, placed between two half-rounds, is carefully lowered; then the tamping is proceeded with in the usual way. When the powder is exploded the wedge, which is driven forcibly up between the half-rounds, breaks the rock in a direction corresponding to its thin end. One of the worst results of this procedure is that considerable rock near the top of the hole is apt to be huffed or flaked up.

Within a few years past the Knox system of blasting rock has been introduced and successfully used with general satisfaction in many of the larger quarries. The results obtained are those which were sought for by lewising, but the process is safer, quicker, takes less powder, and, as it never shatters the rock, not only gives good, sound blocks as the product of the blast, but also leaves the standing rock with a perfectly sound, clean face for future operations. A round hole is first drilled to the required depth, and into this is driven a reamer, which produces V-shaped grooves at opposite sides to the entire depth of the hole. The charge is then inserted, and the tamping is done in the usual manner, except that instead of driving the tamping down upon the top of the charge an air space or cushion is reserved between the charge of powder and the tamping and as far above the charge as possible. The explosive has, therefore, the greatest possible chance for expansion before actually breaking the rock, the tamping being put down only to a sufficient depth to insure firmness of position. The result of this method is that the force of the explosive is directed in the line of the grooves, and no shattering of the rock occurs if it be solid, such as is common in ordinary blasting operations, and, as a consequence, quarrymen are enabled to get out stone of rectangular shape without waste or loss of valuable rock.

The explosive used for breaking out dimension stone is black blasting powder, as its action is somewhat slower than that of the various forms of nitro-glycerine, and there is consequently less danger of shattering the rock or of weakening it by starting incipient fractures, that may not be detected until it is in place in a building; but for breaking up poor stone or for getting out rock regardless of size or form giant powder is frequently employed.

In a quarry having rather thin sheets and numerous vertical joints very good splits may be made with wedges driven between half-rounds (plug and feather) into small holes drilled a few inches apart along a prescribed line, every few feet a deeper hole of a somewhat larger dimension being drilled to guide the fracture; but this process is chiefly used for subdividing the blocks after they have been loosened by powder and for initial splits in quarries where the drift is vertical.

Owing to the great obduracy of this stone and the fact that the different minerals composing it vary greatly in hardness, the chief work of shaping it is still performed by hand, although improvements have been made from time to time in hand tools, and extensive machinery is now in use for producing certain forms and kinds of finish. The most important improvements of the last decade include the more extended adoption of lathes for turning and polishing columns, urns, etc., and new devices in power machinery for plain polishing.

The usual process followed by stonecutters in shaping blocks may be generalized as follows: The block, having been split out to about the right size by the plug and feather method, is brought to a plane surface on one side, which is accomplished by knocking off overhanging edges and projections with a spalling hammer or spalling tool. Drafts or ledges are then chiseled along two opposite edges. One draft being completed, the workman lays upon it a wooden strip or rule having parallel edges. A second rule is then sunk in the draft made on the opposite side until the two drafts are in the same plane, which is determined by sighting across the upper edges of the rules. The whole face is then worked down to this plane with the tools necessary for the required fineness of finish, a straight-edge being applied from time to time as the work progresses. The point (a steel bar drawn out to a pyramidal end) is used for removing rougher projections. This is followed by the pean hammer (which is shaped like a double-edged wedge), and, if a smoother surface is required, it is made by bush-hammering, the hammer having the fewest number of plates being used first.

The bush hammer is made of steel plates brought to an edge bolted together and attached to a long handle; it produces a smoother surface than the pean hammer, the degree of smoothness depending upon the number of steel plates in the particular hammer used. These hammers, which are all of the same thickness, are called 4-cut, 5-cut, etc., according to the number of plates used in their construction. The required size of the face being marked out upon the first surface, the position of a second face may be determined by chiseling drafts across the ends of an adjacent surface, using for the purpose either a square or a bevel, depending upon the angle it is desired to make with the first face. The projecting rock between the drafts having been removed in the manner used in forming the first surface, a third face may be projected. A winding surface is formed by using in one draft a rule or strip having its opposite edges not parallel, the amount of divergence depending upon the amount of warp required. This rule is sunk till its upper edge is even with the upper edge of the strip, having parallel edges placed upon the opposite edge of the stone.

A cylindrical surface is worked by using curved rules in one direction, and is not as hard a matter as might at first seem. Much difficulty is, however, encountered in laying out and working spiral, conical, and spherical surfaces, as it is first necessary to form plane and cylindrical faces on which to apply the necessary bevels and templets.

The manufacture of paving blocks, though an important adjunct of the granite business, varies, for obvious reasons, in many of its details from the ordinary methods of granite cutting. The high skill and fine workmanship of the stonemason are not needed, but a quickness in seeing and taking advantage of the directions of cleavage, as well as a deftness in handling the necessary tools, is requisite.

The tools used for making blocks are knapping hammers, opening hammers, hand hammers, reels, chisels, and, for initial splits, drills, wedges, and half-rounds. When the blockmaker quarries his own stock it is called "motion work," and the same process is used as in quarrying stone for other purposes, except that, as large blocks are not required, most of it can be done with plug and feather.

Slabs, having been split out in the usual manner to sizes that may be easily turned over and handled by one man, are subdivided into pieces corresponding approximately to the dimensions of the required blocks. This is done by striking repeated blows upon the rock along the line of the desired break with heavy knapping and opening hammers. When a break is to be made crosswise the grain it is frequently necessary to chise a light groove across one face and commonly across the adjacent sides to guide the fracture produced by striking on the opposite surface with the opening hammer. Good splits can, however, be made along either the rift or grain by the skillful use of the opening hammer alone. Blocks broken out in the manner described are trimmed and finished with the reel, which is a hand hammer having a long, flat, steel head attached to a short handle. Block breakers become very expert in the use of this instrument, and without making any measurements turn out in a surprisingly short time a large number of blocks. In Maine, which ranks far ahead of any other state in the number of paving blocks made, the entire product of many quarries is used for this exclusive purpose. This is also the case in California, though the blocks are manufactured chiefly from the surface "boulders" or detached masses of basalt, so common in Sonoma county. Other quarries, however, in various parts of the country utilize only the "grout," small or irregular shaped pieces, for this purpose.

Next in importance to the manufacture of paving blocks, in the division of granite for street work, is the production of long granite slabs for curbstone. Granite having a free rift is preferred for this purpose, on account of its better working qualities. The dimensions of ordinary curbstone are from 6 to 12 feet long, 6 to 8 inches thick, and about 2 feet deep. The top edge is made full and square and neatly bush-hammered; the face is also bush-hammered down about a foot from the top. The ends are dressed smooth, so as to make close joints, and the back of the stone, which is placed next to the sidewalk, is also dressed a few inches from the top.

There has been a decided increase in the use of polished granite for cemetery, monumental and decorative purposes since the introduction of machinery for its polishing, which has greatly decreased the price for this kind of finish. The varieties of granite susceptible of the highest and most enduring polish are those containing the largest percentages of the hard minerals, quartz and feldspar, quartz being especially important. Hornblende, however, takes a fairly good polish, and contributes largely to the coloring of most dark granites. Pyroxene of the type occurring in the Quincy granites is rather bad, since, owing to its brittleness, it cracks out more or less and leaves small pits in the finished face. Much mica, especially in large plates, is objectionable, as it will not polish, but remains dull and lustreless except where the direction of its cleavage planes happen to coincide with the face of the stone.

After being prepared by bush hammering, the block is transported to the shop or mill to receive further smoothing and its final finish. The surface to be worked upon is brought to a horizontal position and ground smooth with an abrasive material mixed with water and moved about by a revolving iron or steel disk perforated with holes or made of concentric rings. This disk, which is 12 or 14 inches across, is revolved by an upright shaft, to the bottom of which it is fastened, and the power is communicated through a main shaft running overhead. Joints in the upright or counter shaft and its peculiar attachment to the main shaft allow its lower end to be swung over a considerable area, thus permitting the workman who guides it to move it over a surface of stone many times larger than the disk itself.

The abrasive material now almost exclusively used for grinding granite is either chilled-iron globules, steel emery, or crushed steel. A coarse grade is used at first, then a finer kind, and for the last grinding fine emery is often used. Polishing is done in much the same way as grinding, except that a felt-covered disk is used in place of an iron one, and putty powder, mixed with a little water, instead of coarser grinding materials. Before the final polish, however, the surface is usually given a dull gloss or "skin coat" by the disk and water alone. A polish is sometimes produced by the use of oxalic acid instead of putty powder, but the polish thus made is less durable. Moldings are ground and polished by means of blocks fitting the grooves dragged back and forth either by power or hand.

Granite for columns, balusters, round posts and urns is now worked chiefly in lathes, which, for the heaviest work, are made large enough to handle blocks 25 feet long and 5 feet in diameter. Instead of being turned to the desired size by sharp-cutting instruments, as in ordinary machines for turning wood and metal, granite is turned or ground away by the

* From a Census report.

wedge-like action of rather thick steel disks, rotated by the pressure of the stone as it slowly turns in the lathe. The disks, which are six or eight inches in diameter, are set at quite an angle to the stone, and move with an automatic carriage along the lathe bed. Large lathes have four disks, two on each side, and a column may be reduced some two inches in diameter the whole length of the stone by one lateral movement of the carriages along the bed. The first lathes for turning granite cut only cylindrical or conical columns, but an improved form is so made that templets or patterns may be inserted to guide the carriages, and columns having any desired swell may be as readily turned. For fine grinding and polishing the granite is transferred to another lathe, where the only machinery used is to produce a simple turning or revolution of the stone against iron blocks carrying the necessary grinding or polishing materials.

Blocks are prepared for lathe work by being roughed out with a point, and by having holes chiseled in their squared ends for the reception of the lathe dog and centers. This principle of cutting granite by means of disks revolved by contact with the stone has been also applied to the dressing of plain surfaces, the stone worked upon being mounted upon a traveling carriage and made to pass under a series of disks mounted in a stationary upright frame.

Tracery and lettering for polished granite are usually first drawn upon paper, which is firmly pasted to the surface, and the design chiseled through it to the requisite depth in the rock.

Statues, capitals, keystones, and, in general, all highly ornamental designs, are worked out with chisels from detail drawings or plaster casts. It is necessarily a slow process, owing to the hardness of the rock, and the cost of such work is consequently great. The MacCoy pneumatic tool, however, which has been recently patented and successfully applied to this purpose, gives promise of superseding much of the tediousness of the hand process. This instrument is connected to a flexible pipe, supplying the compressed air or steam by which it is driven, and works at a remarkably high rate of speed. It may be moved to any part of a surface, and works with a celerity unapproached by other means.

The use of granite for sculpture is steadily increasing, particularly for outdoor statuary. The white fine-grained muscovite-biotite granite found at Hallowell, Manchester and Augusta, in Maine, is particularly well adapted for this purpose. Statues made of the Hallowell granite are to be found in nearly every state, though possibly the stone is not superior to varieties found in other localities.

THE MOEBIUS ELECTROLYTIC PARTING PROCESS AT PINOS ALTOS.

Written for the Engineering and Mining Journal by George W. Maynard.

During a late trip into western Chihuahua I took occasion to visit the mines and works of the Pinos Altos Company, an English organization, which has been carrying on successful work for the past ten years. The manager, Mr. Waithman, very courteously supplied me with information as to its workings. That portion of the plant which has for its object the parting of gold and silver is of sufficient interest, I hope, to justify my giving an account of it in considerable detail. The system which has been adopted, and which is being carried out so successfully, is that of Mr. Bernard Moebius. It had not, however, been my good fortune to see a plant of this kind until visiting Pinos Altos. Preliminary to the description of the process, however, it may be well to state that the Pinos Altos Company has a Fraser & Chalmers 55-stamp mill, which is actuated by a 300 horse-power compound Corliss engine. All of the machinery had to be carried in on muleback, a distance of over 100 miles, from the terminus of the wagon road at Guerrero, and is a triumph of the sectionalizing of machinery, a branch of work in which Fraser & Chalmers have shown themselves to be particularly expert.

The Pinos Altos ore is a free-milling silver ore carrying gold. Previous to the adoption of the Moebius process the bullion was shipped to the United States or England, for, notwithstanding the heavy freight charges and the export duty levied by the Mexican government, more was realized than though the bullion had been turned into the Chihuahua mint, which does not pay for less than ·003 (6·2 cents in the ounce) of the gold contained in the bullion. In case the bullion does not contain gold, the rates are so fixed that it is found more profitable to sell to the mints than to export. Free coinage obtains in Mexico, the mints being obliged to take all the silver which may be offered, paying therefor $1.12.5 per fine ounce; the Mexican ounce being ·925 of the ounce of Troy. There is a charge of $1 per kilo for parting when ·003 or more of gold is present, and $2 for each bar assayed. The Mexican dollar is ·902 fine, and the weight is 420 grains Troy, equivalent to 378 grains fine silver.

If the bullion is exported the government export duty is 4·41% for silver and 4·62% for gold, in addition to the assay charges. These charges plus the cost of transportation regulate exchange. There is also a state tax on bullion production of 1¼%. A large saving is effected, however, by the payment of a fixed annual sum.

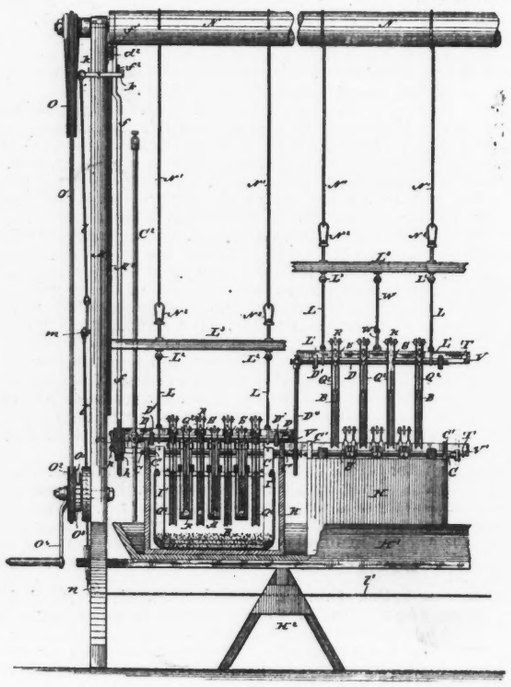
As a rule the pure silver in the Mexican dollar is worth more than in the bullion to the extent of ¾% to 1½%, because the dollars are shipped to London or San Francisco for the Indian or China markets.

The plant for carrying out the Moebius electrolytic parting process at Pinos Altos has a capacity of 3,500 to 4,000 ounces of doré silver in 24 hours, and consists of a tank 12 feet in length, 2 feet wide, and 20 inches in depth, divided into seven compartments, technically known as cells. The cells are lined with rubber packing so that all leakage is prevented. Four pure silver sheets are placed in each cell as cathodes and six doré bullion plates as anodes, which are so placed that anodes face both sides of a cathode. A bag stretched over a frame of wood covered with hard rubber, surrounds each pair of anodes. Underneath the electrodes at the bottom of the cell there is placed a tray which has a perforated bottom, covered with asbestos cloth and hinged to the tray on one side and kept in position on the other by movable pins. Automatic brushes or scrapers are constantly moving along the electrodes. The success of the process is largely due to this brushing device. By means of a hoisting arrangement above the battery the electrodes, frames, bags, trays and scrapers are lifted, so that the exciting liquid alone remains in the cells. The object of this arrangement is to facilitate the quick cleaning of the battery and the removal of the silver and gold precipitates.

The process is carried on as follows. The doré bullion, which varies in fineness from ·800 to ·900 in silver and 25 to 50 in gold, is cast into thin plates. The plates are hung in the cell and subjected to the action of a current of small electromotive force. The exciting liquid consists mainly of a solution of nitrate of copper and nitrate of silver acidulated with nitric acid. The solution may be formed in the battery if the process is started with a very dilute (1%) nitric acid and adding more acid by degrees as the copper content of the bullion may require it. The silver passes into solution from the anodes, and is precipitated as heavy needle-, and tree-like crystals at the cathodes. These crystals would rapidly grow over the anodes if they were not continuously scraped off and allowed to drop into the tray beneath. The dissolving and precipitation go on without intermission as the acid liberated by the deposition of the metallic silver goes back to the anode and again dissolves an equivalent amount of silver. If the cathode were allowed to become completely covered the dissolving action of the current would soon cease, because the electrodes would be short-circuited, silver would drop into the anode bag, mix with the gold, and the whole operation would cease. By reason of the scrapers the electrodes can be brought very near to each other, whereby the resistance of the cell is considerably diminished and a smaller amount of electrode surface is required, thus effecting a great saving of metal, which would otherwise be locked up in the anodes. Another advantage of the brush arrangement is that it prevents polarization in the cell and consequent waste of power. By agitating the exciting liquid, the bad effects resulting from the formation of layers of different specific gravity are avoided.

The copper from the anodes is also dissolved, but as it is less electronegative it remains in solution, provided the exciting liquid is sufficiently acidulated or carries a sufficient amount of nitrate of silver.

All the lead (as peroxide), the platinum metals, antimony, and other



impurities remain with the gold in the bag surrounding the anodes. In the course of time the exciting liquid becomes too concentrated in copper and needs to be regenerated in order to get back the nitric acid and to obtain the copper contained in the bullion. The regeneration can be effected by the electric current and the use of carbon anodes and copper cathodes, but at Pinos Altos the old solutions are used to great advantage in the amalgamating pans in the place of bluestone.

It is evident that if the doré bullion were free from copper, no acid would be consumed, as the exciting liquid would not be contaminated and therefore would not have to be regenerated or replaced. In Mexico there is no necessity for producing ·999 fine silver, because the mints accept for coinage without refining charges all bullion over ·900 fine, where the alloyage is copper.

The manual labor connected with the process is very light. At Pinos Altos the assayer and his helper perform the duties. Every 24 hours the separated silver and gold is removed from the battery. This is done by turning a crank, by means of which the electrodes, conductors, the tray containing the silver precipitate, and the bag frame containing the gold are raised up, leaving only the exciting liquid in the cells.

A movable tank on castors, provided with a false or filtering bottom and a chute extending under the silver trays, is pushed alongside the battery. By removing the pins holding the bottom of the trays, the silver precipitate drops on the chute and into the tank. After a superficial washing the silver is ready to be dried and melted into bars of ·999 to 1·000 fine.

The bag frames containing the gold are also removed and turned into a tank filled with water, which is also provided with a false bottom. The gold is filtered (by drawing the water from the tank), dried and melted, whereby the lead and other impurities go into the slag.

It will thus be seen that all the operations are very simple, and that skilled labor is uncalled for. The process is a very clean one. There are no fumes and noxious gases, no handling and transferring of solutions

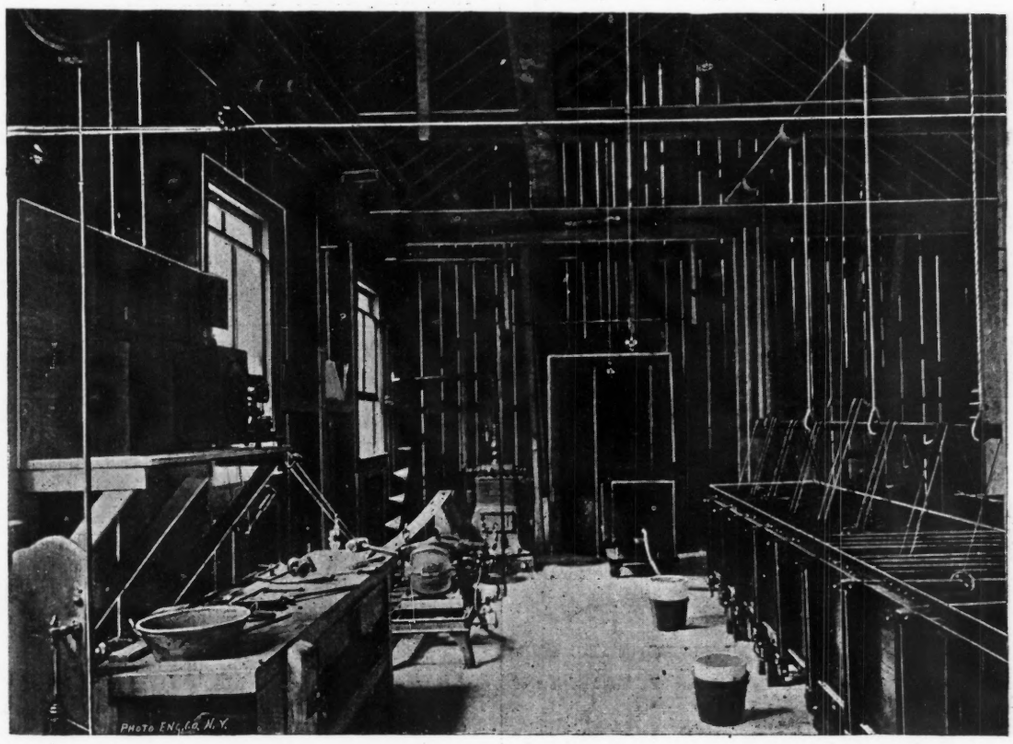
no bye-products, and therefore no chance for loss of precious metals. As there is only a nominal expenditure of acid or other chemicals the process may be readily carried on wherever power can be obtained.

The electric current employed is 170 amperes and about eight volts, which corresponds to an expenditure of only 2½ horse power for parting 3,500 to 4,000 ounces per day. Since the adoption of the Moebius process the gold alone is shipped to England, the silver being turned into the Chihuahua mint. Not only is all the gold saved by this process but there is also a saving in time, exchange, expressage, and export duties, and, above all, the cost of parting is less than by any other known process.

There is a popular notion that a large amount of capital must necessarily be locked up in the anodes, solutions, etc. The result of my inquiry on this subject is that the doré silver is cast into anode plates 10 inches long and 8 inches wide, and from $\frac{3}{16}$ to $\frac{1}{4}$ inch in thickness; the plates weigh on the average about 100 ounces. In each of the seven compartments there is room for six plates, therefore it takes 42 plates or about 4,200 ounces of bullion to fill the apparatus at the start, which, as already stated, has a parting capacity of 3,500 to 4,000 ounces per 24 hours.

In the course of time and when the process is in continuous operation and the anode plates have become more or less decomposed, the actual amount of metal locked up in the anodes is much less than 4,200 ounces. The exciting liquid or stock solution contains variable quantities of silver but not to exceed 300 ounces. The cathodes which are made of pure silver represent an intrinsic value of about $1,000 and should be counted in with the original cost of the plant.

The silver and gold precipitates are removed from the apparatus every



MOEBIUS' ELECTROLYTIC PARTING PROCESS AT PINOS ALTOS.

24 hours, and may be immediately melted into bars, so that there is no locking up of metals here for future operations. It will be seen from the above that at no time is there more than twice the daily capacity locked up in the plant; in other words, the doré silver can be parted within two days. At Pinos Altos there is a general clean-up every month in mill and parting department, and in the latter only about 1,500 ounces of silver are retained in the stock solution and anode scraps, which are worked up in the following month's parting.

I am informed that the original cost of the Pinos Altos plant was $6,000, including $1,000 worth of pure silver sheets for electrodes; this was under a guarantee that the cost of parting should not exceed one-third of a cent per gross ounce of bullion. The royalty charge is one-third of a cent per ounce. The contracting party had to furnish everything with the exception of the steam connections and room 25 × 25 feet. Considering the heavy expenses for freight, including several weeks of mule-back transport, custom duties, the traveling and living expenses of the constructing engineer and his assistants, it is evident that the first cost of the plant must have been very moderate.

In the United States the process has been in successful operation at the works of the Pennsylvania Lead Company, at Pittsburg, since September, 1886, where 30,000 to 40,000 ounces of doré bullion are parted daily. The first plant was erected at the works of the Kansas City Smelting and Refining Company. I am informed that the St. Louis Smelting and Refining Company has lately contracted for a plant of a capacity of 35,000 to 40,000 ounces a day.

Progress of the Nicaragua Canal.—Though the force of men employed on this great work is small at present, progress is being steadily made. The pier at Greytown which is to be built to the outer bar, a distance of about 2,000 feet, is complete for 800 feet and 200 feet more is well advanced. The channel into the harbor thus formed is being dredged, and is already about 9 feet deep at low tide. The canal cut has been opened for a distance of 1,200 yards to a depth of 16 feet and a width of 250 feet. A second set of dredges will deepen it to 35 feet. Nine miles of railway have been completed and the tenth mile is graded. The buildings and plant of the company are satisfactory in the main. The line on the Pacific side has been cleared for a portion of the way, some blasting has been done in the River San Juan, and the eastern division has been cleared as far as the Divide. The final survey of the line cost $400,000.

Precious Stones in Australia.—It appears from a publication recently issued by the Government Statistician of New South Wales, says the *Australian Manufacturer*, that many descriptions of gems have been discovered in various parts of the Australian colonies, but no systematic search has been made for any but the diamond. Diamonds are found in New South Wales, Victoria and Queensland, but only in the first-named colony have any attempts been made to work the diamond drifts. The principal diamond fields are situated at Bingera, near Inverell, in the New England district. The government of New South Wales has on various occasions obtained the services of experts to report upon the fields, and these reports, it is said, have generally been of an encouraging nature. The number of diamonds found in the colony to the end of 1887 is estimated at 75,000, the largest one being 5⅛ carats, or 16·2 grammes. The diamonds occur in old tertiary river drifts and in the more recent drifts derived from them. The deposits are extensive, and have not yet been thoroughly prospected. The New South Wales diamonds are harder and much whiter than the South African diamonds, and are classified on a par with the best Brazilian gems. During the year 1887 the diamond companies at Cope's Creek, near Bingera, produced about 23,000 diamonds, weighing 5,151 carats; but in 1888, owing to the severe drought which occurred, the search for diamonds had to be temporarily abandoned.

A Method of Rendering Water-Gas Odorous.—Messrs. F. Scudder and H. G. Colman, of London, Eng., have devised an improvement in the manufacture and treatment of gases containing carbonic oxide, such as water-gas, for the purpose of rendering them odorous. It is proposed to add a volatile organic sulphide produced by acting on acetone with sulphuretted hydrogen in presence of a dehydrating agent, such as hydrochloric acid, with or without zinc chloride. The moderate quantity of steam used to carry the sulphide to the gas to be impregnated is sufficient also to volatilize the sulphide. The volatile organic sulphide (thio-acetone, or sulphurized acetone) above referred to can be prepared by mixing five parts by weight of acetone (boiling point 133°—137° F.) with four parts by weight of hydrochloric acid, specific gravity 1·16, cooling the mixture to 60° F., and adding one part by weight of zinc chloride. This mixture, which should always be freshly prepared, is treated with sulphuretted hydrogen, preferably in a series of vessels; if four vessels be used the first can be removed after the sulphuretted hydrogen has passed through for eight or ten hours, and a fresh vessel placed at the end of the series. The resulting product contains an oil and an aqueous solution, of which the former contains the larger quantity of thio-acetone. The oil can be drawn off or the raw mixture distilled in a current of steam at atmospheric pressure, the distillate being allowed to follow directly into an odorizing reservoir. The odor is perceptible and lasting and not likely to be lost or appreciably diminished by condensation. The gas should be purified by hydrated iron to remove any free sulphuretted hydrogen.

SPONTANEOUS COMBUSTION OF THE REFUSE OF A LEBLANC SODA WORKS.

Written for the Engineering and Mining Journal by A. D. Elbers.

According to the *Zeitschrift für angewandte Chemie* of April 15, 1891, a peculiar accident occurred on the 23d of February last at the refuse banks of the soda works in Schalke (Germany).

A horse used in shunting the mine trucks disappeared suddenly in passing over the bank, the only trace left being a hole in the ground which disclosed that the interior of the bank was aglow and at a bright red heat. This cave-in took place in the direction of the center of the bank and about ten meters distant from the incline over which the refuse is pumped out. Hence the spot must have been covered by a long ac cumulated and therefore rather solid crust, which yielded, however, to the weight of the animal.

Of the refuse of the Leblanc process, in the wet state in which it is cast off, from 1½ to 2 tons are produced with every ton of soda, and it consists, essentially, of calcium sulphide. The calcium sulphide, though only slightly soluble in pure water, is readily decomposed in the wet state by atmospheric influences, and under the conditions herein referred to it is apt to undergo some of the following changes:

$2CaS + O + H_2O = Ca(OH)_2 + CaS_2$
$CaS_2 + 3O = CaS_2O_3$
$CaS_2O_3 + O = CaSO_4 + S$
$CaS_2O_3 = CaSO_3 + S$
$S + 2O = SO_2$
$CaSO_3 + O = CaSO_4$
$CaS + CO_2 + H_2O = CaCO_3 + H_2S$
$CaS + H_2S = CaH_2S_2$
$CaH_2S_2 + CO_2 + H_2O = CaCO_3 + 2H_2S$
$CaH_2S_2 + O = CaS_2 + H_2O$
$CaH_2S_2 + 4O = CaS_2O_3 + H_2O$

$2FeS + 3O + 3H_2O = Fe_2(HO)_6 + 2S$
$2Fe_2(HO)_6 + 3H_2S = 2FeS + 6H_2O + S$
$6FeS + 27O + 3H_2O = 2Fe_2SO_4Fe_2(HO)_6$
$CaH_2S_2 + 2Fe_2SO_4Fe_2(HO)_6 = 6FeS + 6H_2O + 6S + 3CaSO_4$
$2H_2S + SO_2 = 2H_2O + 3S$
$2CaS_2 + 3SO_2 = 2CaS_2O_3 + 3S$
$CaH_2S_2 + 2SO_2 = CaS_2O_3 + H_2O + 2S$
$CaS_2O_3 + 3CaH_2S_2 = 4CaS_2 + 3H_2O$
$3CaS_2 + 2CO_2 + 2O = 2CaCO_3 + CaS_5 = S.$

This portentous series is not said to comprise *all* of the possible reactions, but only the more important ones. It also tends to show how a small quantity of iron oxides can, in the presence of abundant moisture, gradually oxidize a large quantity of calcium sulphide. The calcium hydrosulphide is conveyed by the percolating rain or surface-water to the ferric hydrate, the hydrate changes to ferrous sulphide, the latter reoxidizes to ferric hydrate, and so on. With every oxidation of that kind heat is set free, and these oxidations repeat themselves in the same spot, under surroundings which retard radiation. Hence the heat can accumulate until a considerable portion of the mass becomes red hot and *melts*, when it forms large cavities within the bank. The combustion of the precipitated sulphur, which is finely distributed in those portions of the waste that have undergone decomposition, helps, of course, to spread the fires. Usually, however, such spontaneous combustion remains confined within rather narrow limits, because the atmospheric oxygen cannot penetrate very deeply into the bank when the customary precautions are observed. An ignition of such magnitude as to render an accident like the one herein referred to possible is therefore an extraordinary occurrence. Its indirect cause, as the informant explained in detail, was the abnormal severity of the past winter. The waste dumped on the bank during the frequent frosts got into a condition which facilitated the formation of cavities in the interior of, as well as the influx of the atmospheric air into, the bank.

The series of reactions adduced in the foregoing serves admirably to trace the mysterious doings of the "steel-eating worm" alluded to in the ENGINEERING AND MINING JOURNAL of February 1st. 1890, in another direction. The "mineral wool" which is applied to steam pipes for the purpose of preventing radiation of heat usually contains several per cent. of calcium sulphide. Taking the aforesaid reactions into account, it is easy to see under which adverse conditions—such as may be brought about by the leakage of steam—this material is apt to cause the corrosion of the pipes and their ultimate destruction.

HOBOKEN, May 5, 1891.

NEW SPECIFIC GRAVITY TABLES FOR HYDROCHLORIC AND NITRIC ACID.*

Written for the Engineering and Mining Journal by G. Lunge, Ph. D., Professor of Technological Chemistry, Polytechnic School, Zurich.

The tables hitherto mostly in use for reducing hydrochloric and nitric acid of various specific gravities to percentages of real acid or to some other more arbitrarily chosen unit, have been those of Ure and Kolb, both of which are known to be not quite accurate. Since it is of great importance for all practical purposes to possess really trustworthy tables, I have undertaken to establish such in the same way as I had previously done for sulphuric acid, together with Mr. Isler (*Zeitsch. f. angew. Chemie*, 1890, p. 129 *et seq.*). In the present case my co-operators have been Mr. Marchlewski for hydrochloric acid and Dr. Rey for nitric acid.

We have tried to render both the determinations of the specific gravities and the analysis of the acids as accurate as it is possible to do with the appliances of a first-class laboratory. The former operation was carried out in specific gravity bottles of the form shown in Fig. 1, holding about 40 c.c. of water. The ground-in thermometers were divided into $\frac{1}{10}$ degrees Centigrade, and compared with standard thermometers. The cap, *a*, is provided with a capillary tube, so that any acid entering into it when the temperature is rising between the observation and the weighing may do so without exerting pressure on the contents of the bottle. Without this precaution sometimes a little acid is forced out of the ground-in joints. This instrument is made easier to handle than a Sprengel pycnometer, and yields even more accurate results if properly treated. All observations were made at 13°, 15° and 17° C., and the weighings made to $\frac{1}{10}$ millegramme. Each series of observations was repeated at least twice, and the accuracy thus attained is equal to at least ±0·0001. All observations are reduced by calculation to water of 4° C., and to weighing in the empty space.

The analysis of the acids was performed by titrating with an approximately fifth-normal solution of soda, using methyl-orange as an indicator. The soda solution was standardized by means of fifth-normal hydrochloric acid. The standard of the latter was taken by two entirely different methods, viz., volumetrically by pure sodium carbonate and gravimetrically by precipitation with silver nitrate. Each of these methods was several times repeated by two independent observers, and a most satisfactory agreement was established among those estimations. It is hardly necessary to say that all weights, burettes, and pipettes were expressly rechecked for the occasion. The variations among the estimations of the various observers did not exceed $\frac{1}{2000}$ of the total amount, which is probably the greatest accuracy ever attained in making a standard solution.

The weighing of the samples of acids was performed, in case of the weaker acids, in Winkler's glass-tap pipettes, Fig. 2; in case of the stronger acids, partly in glass bulbs seated before the lamp, partly in a new kind of pipette, which I can strongly recommend for all similar cases; it is shown in Fig. 3. We notice two glass taps, *a* and *b*, with a bulb, *c*, of about ¾-inch diameter in between, and the tapering tube *d* below. The latter is thickened at its upper end, and is there ground in an outer glass tube, *e*. Channels *f* and *g* do not go right through, so that the communication with the outer air can be established or interrupted at will. When the pipette is to be used, suction is applied with the mouth at the outer end, *h*, of the pipette, tap *b* being closed beforehand and *a* after the suction, so that the air in bulb *c* is rarefied. Now, point *d* is immersed in the acid to be tested, and tap *b* is opened, which causes the acid to rise up in *d*. It must not be allowed to reach the tap *b*, which is now closed. The pipette is cleaned outwardly, is inserted in the tube *e*, and is weighed. Now tap *b* is opened, and the channels *f* and *g* are made to communicate; the acid runs into the tube *e*, and any fumes remaining in the pipette are washed down by squirting some water through *h*, *a* and *c*. The contents of *e* are washed into a beaker, and are then ready for titration. In this manner the strongest fuming acids can be got into the pipette, weighed, and got out of the pipette again without suffering any loss of fumes.

The quantity of acid to be titrated was always weighed off at once,

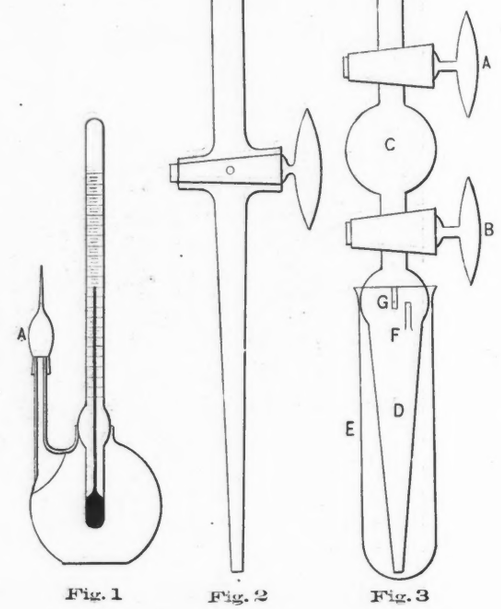


Fig. 1 Fig. 2 Fig. 3

avoiding the chance of error always present when following the plan of measuring the acid. All analyses were made at least twice, once before and once after the observation of the specific gravity, and repeated in the case of the slightest doubt. Taking every possible source of error still extant as having occurred in our observations, it is impossible that the deviation from the truth, even with the most highly concentrated acid, should have exceeded + 0·05%, and with less concentrated acids the deviation must have been less.

Our observations were made with chemically pure acids, prepared from the "pure" articles of commerce by ourselves. This was comparatively easy in the case of hydrochloric acid, but it proved rather difficult with the highest concentrations of nitric acid, which tenaciously retain nitrogen peroxide in solution. When driving this off in the well-known manner, by passing a current of carbon dioxide through the acid heated on a water-bath, some nitric acid is volatilized as well, and the residual acid is weakened. We obtained at last an acid of 99·70% NO_3H, entirely free from lower oxides, by distilling pure nitric acid of 98·7% with a great excess of pure sulphuric acid in a vacuum of 20 millimeters, the apparatus being put together in such manner that no organic substance whatever was employed for making the joints tight. Under these conditions the acid distills over at about 35° C., and is entirely free from N_2O_4.

The following tables give, first, the direct results of observation, stating the means of the single estimations (never deviating from one another more than I have indicated above). I also subjoin the variation of the density for temperatures above or below 15° (between 13° and 17°). The second table gives the corrections for temperature deviations in a shape more convenient for use. The third and principal table gives the percentage of pure acid for different specific gravities, comparing these both with the English (Twaddell's) hydrometer and with the "rational" Baumé's hydrometer, besides the figures corresponding to the ordinary commercial strengths, in order to facilitate stock-takings and the like; and all this is repeated for kilogrammes per litre, as a further convenience for the practical manufacturer. Of course all figures refer to

pure acid; commercial acids, when tested by specific gravity, will always show too much strength, but this varies from case to case, and cannot be dealt with in tables like the present.

TABLE I.

A.—Hydrochloric Acid.			B.—Nitric Acid.		
Per cent. HCl.	Spec. grav. at 15°/4° in the vacuum.	Deviation of spec. gravity for ± 1° C.	Per cent. HNO_3.	Spec. grav. at 15°/4° in the vacuum.	Deviation of spec. grav. for ± 1° C.
1·52	1·0069	∓ 0·00015	1·06	1·00503	∓ 0·00014
2·93	1·0140	0·00017	5·35	1·02900	0·00023
5·48	1·0251	0·00020	9·85	1·05536	0·00032
7·84	1·0381	0·00024	13·94	1·07984	0·00041
9·99	1·0491	0·00027	18·16	1·10647	0·00047
12·38	1·0609	0·00032	23·71	1·14252	0·00058
15·84	1·0784	0·00033	26·52	1·16090	0·00064
17·31	1·0860	0·00035	31·68	1·19528	0·00073
18·36	1·0914	0·00037	34·81	1·21693	0·00079
20·29	1·1014	0·00042	39·37	1·24700	0·00085
22·89	1·1150	0·00044	43·47	1·27370	0·00092
25·18	1·1271	0·00046	48·38	1·30571	0·00103
27·75	1·1405	0·00053	52·35	1·32985	0·00110
29·35	1·1490	0·00054	56·60	1·35452	0·00116
31·28	1·1589	0·00056	60·37	1·37536	0·00127
33·39	1·1696	0·00057	64·27	1·39511	0·00134
35·36	1·1798	0·00057	68·15	1·41271	0·00138
37·23	1·1901	0·00058	72·86	1·43274	0·00141
39·15	1·2002	0·00059	74·79	1·44041	0·00145
			79·76	1·45929	0·00146
			83·55	1·47220	0·00145
			87·93	1·48568	0·00150
			91·56	1·49491	0·00155
			95·90	1·50371	0·00165
			97·76	1·50857	0·00165
			98·86	1·51370	0·00170
			99·70	1·52040	0·00172

TABLE II.

In observations between 13° and 17° C., the following amounts have to be deducted from the specific gravity observed for each degree below 15°, or added for each degree above 15°, in order to reduce the amount to the specific gravity at 15°.

For specific gravity between	Add or deduct for 1° C. above or below 15°	For specific gravity between	Add or deduct for 1° C. above or below 15°
1·000 and 1·040	0·0002	1·121 and 1·155	0·0005
1·041 and 1·085	0·0003	1·156 and 1·200	0·0006
1·086 and 1·120	0·0004		

CORRECTION OF SPECIFIC GRAVITIES FOR TEMPERATURES DEVIATING FROM 15° (BETWEEN 13° AND 18°).

For specific gravities between	Add or deduct for 1° C. above or below 15°	For specific gravities between	Add or deduct for 1° C. above or below 15°
1·000 and 1·020	∓ 0·0001	1·284 and 1·340	∓ 0·0010
1·021 and 1·040	0·0002	1·311 and 1·350	0·0011
1·041 and 1·070	0·0003	1·351 and 1·365	0·0012
1·071 and 1·100	0·0004	1·366 and 1·400	0·0013
1·104 and 1·130	0·0005	1·401 and 1·435	0·0014
1·131 and 1·161	0·0006	1·436 and 1·490	0·0015
1·162 and 1·200	0·0007	1·491 and 1·500	0·0016
1·201 and 1·245	0·0008	1·501 and 1·520	0·0017
1·246 and 1·280	0·0009		

TABLE III.

Spec. grav. at 15° (in the vacuum.)	Degree Twaddell.	Degree Baumé.	100 parts by weight in case of pure acid correspond to						I litre pure acid contains in kilogrammes					
			Parts H Cl.	Parts acid of 18° B.	Parts acid of 19° B.	Parts acid of 20° B.	Parts acid of 21° B.	Parts acid of 22° B.	HCl.	Acid of 18° B.	Acid of 19° B.	Acid of 20° B.	Acid of 21° B.	Acid of 22° B.
1·000	0·0	·0	0·16	0·57	0·53	0·49	0·47	0·45	0·0016	0·0057	0·0053	0·0049	0·0047	0·0045
1·005	0·7	1	1·15	4·08	3·84	3·58	3·42	3·25	0·012	0·041	0·039	0·036	0·034	0·033
1·010	1·4	2	2·14	7·60	7·14	6·66	6·36	6·04	0·022	0·077	0·072	0·067	0·064	0·061
1·015	2·1	3	3·12	11·08	10·41	9·71	9·27	8·81	0·032	0·113	0·106	0·099	0·094	0·089
1·020	2·7	4	4·13	14·67	13·79	12·86	12·27	11·67	0·042	0·159	0·141	0·131	0·125	0·119
1·025	3·4	5	5·15	18·30	17·19	16·04	15·30	14·55	0·053	0·188	0·176	0·164	0·157	0·149
1·030	4·1	6	6·15	21·85	20·53	19·16	18·27	17·38	0·064	0·225	0·212	0·197	0·188	0·179
1·035	4·7	7	7·15	25·40	23·87	22·27	21·25	20·20	0·074	0·263	0·247	0·231	0·220	0·209
1·040	5·4	8	8·16	28·99	27·24	25·42	24·25	23·06	0·085	0·302	0·283	0·264	0·252	0·240
1·045	6·0	9	9·16	32·55	30·58	28·53	27·22	25·88	0·096	0·340	0·320	0·298	0·284	0·270
1·050	6·7	10	10·17	36·14	33·95	31·68	30·22	28·74	0·107	0·380	0·357	0·333	0·317	0·302
1·055	7·4	11	11·18	39·73	37·33	34·82	33·22	31·59	0·118	0·419	0·394	0·367	0·351	0·333
1·060	8·0	12	12·19	43·32	40·70	37·97	36·23	34·44	0·129	0·459	0·431	0·403	0·384	0·365
1·065	8·7	13	13·19	46·87	44·04	41·09	39·20	37·27	0·141	0·499	0·469	0·438	0·418	0·397
1·070	9·4	14	14·17	50·35	47·31	44·14	42·11	40·04	0·152	0·539	0·506	0·472	0·451	0·428
1·075	10·0	15	15·16	53·87	50·62	47·22	45·05	42·84	0·163	0·579	0·544	0·508	0·484	0·460
1·080	10·6	16	16·15	57·39	53·92	50·31	47·99	45·63	0·174	0·620	0·582	0·543	0·518	0·493
1·085	11·2	17	17·13	60·87	57·19	53·36	50·90	48·40	0·186	0·660	0·621	0·579	0·552	0·523
1·090	11·9	18	18·11	64·35	60·47	56·41	53·82	51·17	0·197	0·701	0·659	0·615	0·587	0·558
1·095	12·4	19	19·06	67·73	63·64	59·37	56·64	53·86	0·209	0·742	0·697	0·650	0·620	0·590
1·100	13·0	20	20·04	71·11	66·81	62·33	59·46	56·54	0·220	0·782	0·735	0·686	0·654	0·622
1·105	13·6	21	20·97	74·52	70·01	65·32	62·32	59·26	0·232	0·823	0·774	0·722	0·689	0·655
1·110	14·2	22	21·92	77·89	73·19	68·28	65·14	61·94	0·243	0·865	0·812	0·758	0·723	0·687
1·115	14·9	23	22·86	81·23	76·32	71·21	67·93	64·60	0·255	0·906	0·851	0·794	0·757	0·719
1·120	15·4	24	23·82	84·64	79·53	74·20	70·79	67·31	0·267	0·948	0·891	0·831	0·793	0·754
1·125	16·0	25	24·78	88·06	82·74	77·19	73·64	70·02	0·278	0·991	0·931	0·868	0·828	0·788
1·130	16·5	26	25·75	91·50	85·97	80·21	76·52	72·76	0·291	1·034	0·972	0·906	0·865	0·822
1·135	17·1	27	26·70	94·88	89·15	83·18	79·34	75·45	0·303	1·077	1·011	0·944	0·901	0·856
1·140	17·7	28	27·66	98·29	92·35	86·17	82·20	78·16	0·315	1·121	1·053	0·982	0·937	0·891
1·1425	18·0		28·14	100·00	93·95	87·66	83·62	79·51	0·322	1·143	1·073	1·002	0·955	0·908
1·145	18·3	29	28·61	101·67	95·52	89·13	85·02	80·84	0·328	1·164	1·094	1·021	0·973	0·926
1·150	18·8	30	29·57	105·08	98·73	92·11	87·87	83·55	0·340	1·208	1·135	1·059	1·011	0·961
1·152	19·0		29·95	106·43	100·00	93·30	89·01	84·63	0·345	1·226	1·152	1·075	1·025	0·975
1·155	19·3	31	30·55	108·58	102·00	95·17	90·79	86·32	0·353	1·254	1·178	1·099	1·049	0·997
1·160	19·8	32	31·52	112·01	105·24	98·19	93·67	89·07	0·366	1·299	1·221	1·139	1·087	1·033
1·163	20·0		32·10	114·07	107·17	100·00	95·39	90·70	0·373	1·326	1·246	1·163	1·109	1·054
1·165	20·3	33	32·49	115·46	108·48	101·21	96·55	91·81	0·379	1·345	1·264	1·179	1·125	1·070
1·170	20·9	34	33·46	118·94	111·71	104·24	99·43	94·55	0·392	1·391	1·307	1·220	1·163	1·106
1·174	21·0		33·65	119·58	112·35	104·82	100·00	95·09	0·394	1·400	1·316	1·227	1·171	1·113
1·175	21·4	35	34·42	122·32	114·92	107·22	102·28	97·26	0·404	1·437	1·350	1·260	1·202	1·143
1·180	22·0	36	35·39	125·76	118·16	110·24	105·17	100·00	0·418	1·484	1·394	1·301	1·241	1·180
1·185	22·5	37	36·31	129·03	121·23	113·11	107·90	102·60	0·430	1·529	1·437	1·340	1·279	1·216
1·190	23·0	38	37·23	132·30	124·30	115·98	110·63	105·20	0·443	1·574	1·479	1·380	1·317	1·252
1·195	23·5	39	38·16	135·61	127·41	118·87	113·40	107·83	0·456	1·621	1·523	1·421	1·355	1·289
1·200	24·0	40	39·11	138·98	130·58	121·84	116·22	110·51	0·469	1·667	1·567	1·462	1·395	1·326

TABLE III.

Specific gravities at 15°.	Degrees Baumé.	Degrees Twaddell.	100 parts by weight contain by parts					One litre contains in kilogrammes				
			N_2O_5.	HNO_3.	Acid of 36° Bé.	Acid of 40° Bé.	Acid of 48½° Bé.	N_2O_5.	HNO_3.	Acid of 36° Bé.	Acid of 40° Bé.	Acid of 48½° Bé.
1·000	0	0	0·08	0·10	0·19	0·16	0·10	0·001	0·001	0·002	0·002	0.001
1·005	0·7	1	0·85	1·00	1·89	1·61	1·03	0·008	0·010	0·019	0·016	0·010
1·010	1·4	2	1·62	1·90	3·60	3·07	1·95	0·016	0·019	0·036	0·031	0·019
1·015	2·1	3	2·39	2·80	5·30	4·52	2·87	0·024	0·028	0·053	0·045	0·029
1·020	2·7	4	3·17	3·70	7·01	5·98	3·79	0·033	0·038	0·072	0·061	0·039
1·025	3·4	5	3·94	4·60	8·71	7·43	4·72	0·040	0·047	0·089	0·076	0·018
1·030	4·1	6	4·71	5·50	10·12	8·88	5·64	0·049	0·057	0·108	0·092	0·058
1·035	4·7	7	5·47	6·38	12·08	10·30	6·54	0·057	0·066	0·125	0·107	0·068
1·010	5·4	8	6·22	7·26	13·75	11·72	7·45	0·064	0·075	0·142	0·121	0·077
1·045	6·0	9	6·97	8·13	15·40	13·13	8·34	0·073	0·085	0·161	0·137	0·087
1·050	6·7	10	7·71	8·99	17·03	14·52	9·22	0·081	0·094	0·178	0·152	0·096
1·055	7·4	11	8·43	9·84	18·64	15·89	10·09	0·089	0·104	0·197	0·168	0·107
1·060	8·0	12	9·15	10·68	20·23	17·25	10·95	0·097	0·113	0·214	0·182	0·116
1·065	8·7	13	9·87	11·51	21·80	18·59	11·81	0·105	0·123	0·233	0·198	0·126
1·070	9·4	14	10·57	12·33	23·35	19·91	12·65	0·113	0·132	0·250	0·213	0·135
1·075	10·0	15	11·27	13·15	24·91	21·21	13·49	0·121	0·141	0·267	0·228	0·145
1·080	10·6	16	11·96	13·95	26·42	22·53	14·31	0·129	0·151	0·286	0·244	0·155
1·085	11·2	17	12·64	14·74	27·92	23·80	15·12	0·137	0·160	0·303	0·258	0·164
1·090	11·9	18	13·31	15·53	29·41	25·08	15·93	0·145	0·169	0·320	0·273	0·173
1·095	12·4	19	13·99	16·32	30·91	26·35	16·74	0·153	0·179	0·339	0·289	0·184
1·100	13·0	20	14·67	17·11	32·41	27·63	17·55	0·161	0·188	0·356	0·304	0·193
1·105	13·6	21	15·34	17·89	33·89	28·89	18·35	0·170	0·198	0·375	0·320	0.203
1·110	14·2	22	16·00	18·67	35·36	30·15	19·15	0·177	0·207	0·392	0·335	0·212
1·115	14·9	23	16·67	19·45	36·84	31·41	19·95	0·186	0·217	0·411	0·350	0·223
1·120	15·4	24	17·34	20·23	38·31	32·67	20·75	0·195	0·227	0·430	0·366	0·233
1·125	16·0	25	18·00	21·00	39·77	33·91	21·54	0·202	0·236	0·447	0·381	0·242
1·130	16·5	26	18·66	21·77	41·23	35·16	22·33	0·211	0·246	0·466	0·397	0·252
1·135	17·1	27	19·32	22·54	42·69	36·40	23·12	0·219	0·256	0·485	0·413	0·263
1·140	17·7	28	19·98	23·31	44·15	37·65	23·91	0·228	0·266	0·504	0·430	0·273
1·145	18·3	29	20·64	24·08	45·64	38·89	24·70	0·237	0·276	0·523	0·446	0·283
1·150	18·8	30	21·29	24·84	47·05	40·12	25·48	0·245	0·286	0·542	0·462	0·293
1·155	19·3	31	21·94	25·60	48·49	41·35	26·26	0·254	0·296	0·561	0·478	0·304
1·160	19·8	32	22·60	26·36	49·92	42·57	27.04	0·262	0·306	0·580	0·494	0·314
1·165	20·3	33	23·25	27·12	51·36	43·80	27·82	0·271	0·316	0·598	0·510	0·324
1·170	20·9	34	23·90	27·88	52·80	45·03	28·59	0·279	0·326	0·617	0·526	0·334
1·175	21·4	35	24·54	28·63	54·22	46·24	29·36	0·288	0·336	0·636	0·543	0·345
1·180	22·0	36	25·18	29·38	55·64	47·45	30·13	0·297	0·347	0·657	0·560	0·356
1·185	22·5	37	25·83	30·13	57·07	48·66	30·90	0·306	0·357	0·676	0·577	0·366
1·190	23·0	38	26·47	30·88	58·49	49·87	31·67	0·315	0·367	0·695	0·593	0·376
1·195	23·5	39	27·10	31·62	59·89	51·07	32·43	0·324	0·378	0·715	0·610	0·388
1·200	24·0	40	27·74	32·36	61·29	52·26	33·19	0·333	0·388	0·735	0·627	0·398
1·205	24·5	41	28·36	33·09	62·67	53·23	33·94	0·342	0·399	0·755	0·644	0·409
1·210	25·0	42	28·99	33·82	64·05	54·24	34·69	0·351	0·409	0·775	0·661	0·419
1·215	25·5	43	29·61	34·55	65·44	55·18	35·44	0·360	0·420	0·795	0·678	0·431
1·220	26·0	44	30·24	35·28	66·82	56·16	36·18	0·369	0·430	0·815	0·695	0·441
1·225	26·4	45	30·88	36·03	68·24	57·64	36·95	0·378	0·444	0·835	0·712	0·452
1·230	26·9	46	31·53	36·78	69·66	59·13	37·72	0·387	0·452	0·856	0·730	0·466
1·235	27·4	47	32·17	37·53	71·08	60·61	38·49	0·397	0·463	0·877	0·748	0·475
1·240	27·9	48	32·82	38·29	72·52	61·84	39·27	0·407	0·475	0·900	0·767	0·487
1·245	28·4	49	33·47	39·05	73·96	63·07	40·05	0·417	0·486	0·921	0·785	0·498
1·250	28.8	50	34·13	39·82	75·42	64·34	40·84	0·427	0·498	0·943	0·804	0·511
1·255	29·3	51	34·78	40·58	76·86	65·54	41·62	0·437	0·509	0·965	0·822	0·522
1·260	29·7	52	35·44	41·34	78·30	66·76	42·40	0·447	0·521	0·987	0·844	0·534
1·265	30·2	53	36·09	42·10	79·74	67·99	43·13	0·457	0·533	1·009	0·860	0·547
1·270	30·6	54	36·75	42·87	81·20	69·23	43·97	0·467	0·544	1·031	0·879	0·558
1·275	31·1	55	37·41	43·64	82·65	70·48	44·76	0·477	0·556	1·054	0·893	0·570
1·280	31·5	56	38·07	44·41	84·11	71·72	45·55	0·487	0·568	1·077	0·918	0·583
1·285	32·0	57	38·73	45·18	85·57	72·96	46·34	0·498	0·581	1·100	0·938	0·590
1·290	32·4	58	39·39	45·95	87·03	74·24	47·13	0·508	0·593	1·123	0·957	0·608
1·295	32·8	59	40·05	46·72	88·48	75·45	47·92	0·519	0·605	1·146	0·977	0·621
1·300	33·3	60	40·71	47·49	89·94	76·70	48·71	0·529	0·617	1·169	0·997	0·633
1·305	33·7	61	41·37	48·26	91·40	77·94	49·50	0·540	0·630	1·193	1·017	0·646
1·310	34·2	62	42·06	49·07	92·94	79·25	50·33	0·551	0·643	1·218	1·038	0·659
1·315	34·6	63	42·76	49·89	94·49	80·57	51·17	0·562	0·656	1·243	1·059	0·673
1·320	35·0	64	43·47	50·71	96·05	81·90	52·01	0·573	0·669	1·268	1·080	0·686
1·325	35·4	65	44·17	51·53	97·60	83·22	52·85	0·585	0·683	1·294	1·103	0·701
1·330	35·8	66	44·89	52·37	99·19	84·58	53·71	0·597	0·697	1·320	1·126	0·715
1·3325	36·0	66.5	45·26	52·80	100·00	85·27	54·15	0·603	0·704	1·333	1·137	0·722
1·335	36·2	67	45·62	53·22	100·80	85·95	54·58	0·609	0·710	1·346	1·148	0·728
1·340	36·6	68	46·35	54·07	102·41	87·32	55·46	0·621	0·725	1·373	1·171	0·744
1·345	37·0	69	47·08	54·93	104·04	88·71	56·34	0·633	0·739	1·400	1·193	0·758
1·350	37·4	70	47·82	55·79	105·67	90·10	57·22	0·645	0·753	1·427	1·216	0·772
1·355	37·8	71	48·57	56·66	107·31	91·51	58·11	0·658	0·768	1·455	1·240	0·788
1·360	38·2	72	49·35	57·57	109·03	92·97	59·05	0·671	0·783	1·483	1·265	0·803
1·365	38·6	73	50·13	58·48	110·75	94·44	59·98	0·684	0·798	1·543	1·289	0·818
1·370	39·0	74	50·91	59·39	112·48	95·91	60·91	0·698	0·814	1·543	1·314	0·835
1·375	39·4	75	51·69	60·30	114·20	97·38	61·85	0·711	0·829	1·573	1·339	0·850
1·380	39·8	76	52·52	61·27	116·04	98·95	62·84	0·725	0·816	1·603	1·366	0·868
1·3833	40·0	..	53·08	61·92	117·27	100·00	63·51	0·735	0·857	1·623	1·383	0·879
1·385	40·1	77	53·35	62·24	117·88	100·54	63·84	0·739	0·862	1·633	1·392	0·884
1·390	40·5	78	54·20	63·23	119·75	102·12	64·85	0·753	0·879	1·665	1·420	0·902
1·395	40·8	79	55·07	64·25	121·68	103·76	65·90	0·768	0·896	1·697	1·447	0·919
1·400	41·2	80	55·97	65·30	123·67	105·46	66·97	0·783	0·914	1·731	1·476	0·937
1·405	41·6	81	56·92	66·40	125·75	107·24	68·10	0·800	0·933	1·767	1·507	0·957
1·410	42·0	82	57·86	67·50	127·84	109·01	69·23	0·816	0·952	1·803	1·537	0·976
1·415	42·3	83	58·83	68·63	129·98	110·84	70·39	0·832	0·971	1·839	1·568	0·996
1·420	42·7	84	59·83	69·80	132·19	112·73	71·59	0·849	0·991	1·877	1·600	1·016
1·425	43·1	85	60·84	70·98	134·43	114·63	72·80	0·867	1·011	1·915	1·633	1·037
1·430	43·4	86	61·86	72·17	136·68	116·55	74·02	0·885	1·032	1·955	1·667	1·058
1·435	43·8	87	62·91	73·39	138·99	118·52	75·27	0·903	1·053	1·995	1·701	1·080
1·440	44·1	88	64·01	74·68	141·44	120·61	76·59	0·921	1·075	2·037	1·736	1·103
1·445	44·4	89	65·13	75·98	143·90	122·71	77·93	0·941	1·098	2·080	1·773	1·126
1·450	44·8	90	66·24	77·28	146·36	124·81	79·26	0·961	1·121	2·123	1·810	1·150
1·455	45·1	91	67·38	78·60	148·86	126·94	80·62	0·981	1·144	2·167	1·848	1·173
1·460	45·4	92	68·56	79·98	151·47	129·17	82·03	1·001	1·168	2·212	1·886	1·198
1·465	45·8	93	69·79	81·42	154·20	131·49	83·51	1·023	1·193	2·259	1·927	1·224
1·470	46·1	94	71·06	82·90	157·00	133·88	85·03	1·045	1·219	2·309	1·969	1·250
1·475	46·4	95	72·39	84·45	159·94	136·39	86·62	1·068	1·246	2·360	2·012	1·278
1·480	46·8	96	73·76	86·05	162·97	138·97	88·26	1·092	1·274	2·413	2·058	1·307
1·485	47·1	97	75·18	87·70	166·09	141·63	89·95	1·116	1·302	2·466	2·103	1·335
1·490	47·4	98	76·80	89·60	169·69	144·70	91·90	1·144	1·335	2·528	2·156	1·369
1·495	47·8	99	78·52	91·60	173·48	117·93	93·95	1·174	1·369	2·593	2·211	1·404
1·500	48·1	100	80·65	94·09	178·19	151·96	95·50	1·210	1·411	2·672	2·278	1·447
1·501	....	...	81·09	91·60	179·16	152·78	97·03	1·217	1·420	2·689	2·293	1·456
1·502	....	...	81·50	95·08	180·07	153·55	97·52	1·224	1·428	2·704	2·306	1·465
1·503	....	...	81·91	95·55	180·96	154·31	98·00	1·231	1·436	2·720	2·319	1·473
1·504	....	...	82·29	96·00	181·81	155·04	98·46	1·238	1·444	2·735	2·332	1·481
1·505	48·4	101	82·63	96·39	182·55	155·67	98·86	1·244	1·451	2·748	2·343	1·488
1·506	....	...	82·94	96·76	183·25	156·27	99·27	1·249	1·457	2·759	2·353	1·494
1·507	....	...	83·26	97·13	183·95	156·86	99·62	1·255	1·464	2·773	2·364	1·502
1·508	48·5	...	83·58	97·50	184·65	157·47	100·00	1·260	1·470	2·784	2·374	1·508
1·509	....	...	83·87	97·84	185·30	158·01	100·35	1·265	1·476	2·795	2·384	1·514
1·510	48·7	102	84·09	98·10	185·79	158·43	100·62	1·270	1·481	2·805	2·392	1·519
1·511	....	...	84·28	98·32	186·21	158·79	100·84	1·274	1·486	2·814	2·400	1·524
1·512	....	...	84·46	98·53	186·61	159·13	101·06	1·277	1·490	2.822	2·406	1·528
1.513	....	...	84·63	98·73	186·98	159·45	101·26	1·280	1·494	2·829	2·413	1·532
1·514	....	...	84·78	98·90	187·30	159·72	101·44	1·283	1·497	2·835	2·418	1·535
1·515	49·0	103	84·92	99·07	187·63	160·00	101·61	1·287	1·501	2·843	2·424	1·539
1·516	....	...	85·04	99·21	187·89	160·22	101·75	1·289	1·504	2·848	2·429	1·543
1·517	....	...	85·15	99·34	188·14	160·43	101·89	1·292	1·507	2·854	2·434	1·546
1·518	....	...	85·26	99·46	188·37	160·63	102·01	1·294	1·510	2·860	2·439	1·549
1·519	....	...	85·35	99·57	188·58	160·81	102·12	1·296	1·512	2·864	2·442	1·551
1·520	49·4	104	85·44	99·67	188·77	160.97	102·23	1·299	1·515	2·869	2·447	1·554

THE NEW MINING LAWS OF QUEBEC AND ONTARIO.

The first regular quarterly meeting of the Mining Association of the Province of Quebec was held in Montreal on the 29th ult. It was well attended and a large part of the time was devoted to a consideration of a petition to the government for the vetoing of the Quebec mining act. In our issue of last week we gave in full Dr. Rossiter W. Raymond's letter on this subject to Mr. B. T. A. Bell. The President in submitting the Council's report considered this communication at great length, and informed the association that its deputation had had an interview with the officers of the government which did not result in any action being taken, and then submitted for signatures a petition to the Governor-General-in-council praying for the disallowance of the act.

The grounds set forth were that the act was retroactive, that it virtually confiscated the mine owner's land by declaring that the government owned all minerals, whereas the whole course of legislation showed that only the higher metals, such as gold and silver, were so reserved. The report was couched in general terms, and did not enter into details of the effect of the legislation upon the mining interests. It was decided to have the same deputation which interviewed Premier Mercier wait on the Federal Government and present the petition. Thus it is seen that so far the mining men of Quebec have not been very successful in opposing this measure.

In Ontario, the opposition aroused by similar mining legislation, which was introduced by Hon. A. S. Hardy, Commissioner of Crown Lands, has given rise to the most widespread opposition. Under the leadership of Hon. James Commee, M. P. P., every exertion has been made from outside sources to combat this measure. Members representing mining constituencies stoutly opposed it, particularly the royalty feature, which it was declared would be the death blow to mining interests, close half the mines in the districts affected, and throw back the progress of the industry at least twenty years. Notwithstanding this, the bill was allowed to pass its second reading. In committee, however, it has been most vigorously attacked, and, as finally amended, differs materially from the original measure. It has been made to conform more closely to resolutions presented by a delegation on the 14th ult., and now provides that the price of mining lands in the districts of Algoma, Thunder Bay, Rainy River and that part of the Nipissing district lying north of the French River, Lake Nipissing and the Mattawa River, where the same are within 12 miles of a railway, shall be $4.50 per acre; other mining lands to be $3 per acre; for mining lands lying south of the aforesaid lakes and rivers, within 12 miles of any railway, the price will be $3 per acre; when situated elsewhere $2 per acre. These conditions do not apply to bona fide applications for grants made to the Department of Crown Lands prior to April 24th, 1891. To insure speedy development the royalty shall not be imposed upon silver or copper ores mined until after seven years from the date of the patent or lease, and for nickel ore four years are allowed before the royalty shall be imposed.

MINERAL PRODUCTION OF CANADA IN 1890.

The Division of Mineral Statistics and Mines of the Geological Survey of Canada has issued the following statistical table of the mineral production of Canada for 1890. This is not a final and complete statement, there being a few returns not yet received. The data thus absent, however, have been estimated as closely as possible.

Metallic.

PRODUCT.	Quantity (a)	Value.	PRODUCT.	Quantity (a)	Value.
Copper (b), lbs	6,454,913	$968,241	Nickel (f), lbs	1,336,627	1,002,470
Gold (c), ozs	65,014	1,166,227	Platinum, ozs	1,000	4,500
Iron ore (d), tons	76,511	155,380	Silver, ozs	400,687	420,602
Iron, pig tons	21,772	331,688			
Lead (e), lbs	113,000	5,085	Total		$3,722,565

Non-Metallic.

Arsenic, tons	25	$1,500	Mineral paints, tons	325	5,500
Asbestos, tons	8,000	1,039,661	Mineral water, galls	417,165	35,231
Baryta, tons	1,842	7,543	Molding sand, tons	170	750
*Bricks, thousands	208,587	1,247,607	Petroleum (h), bbls	765,029	902,734
*Building stone, cu. yds	360,001	936,168	Phosphate, tons	31,753	361,015
Cement, bbls	102,216	92,405	*Pottery		190,242
Coal, tons	3,117,661	6,396,910	Pyrites, tons	49,227	123,068
Coke (g), tons	56,450	166,298	Quartz, tons	200	1,000
Felspar, tons	700	3,500	Roofing cement, tons	1,171	6,502
Fertilizers, tons	1,203	31,889	Salt, tons	43,754	185,382
Flagstones, sq. ft	17,865	1,643	Sand and gravel (exports), tons	342,158	65,518
Glass		537,130	Sewer pipes		318,003
Granite, tons	13,307	65,985	Slate, tons	6,368	100,250
Graphite, tons	175	5,200	Soapstone, tons	917	1,239
Grindstones, tons	4,884	42,340	Sulphuric acid, lbs	11,118,779	145,235
Gypsum, tons	226,806	196,527	*Terra cotta		50,000
*Lime, bush	2,218,413	364,425	*Tiles, thousands	10,451	140,177
Limestone, for flux, tons	19,824	17,913	Whiting, bbls	500	500
Manganese ore, tons	1,328	32,550	Total		$13,928,417
Marble, tons	780	10,776			3,722,565
Mica		68,074			
Estimated value of mineral products not returned, principally structural materials					1,349,018
Total, metallic and non-metallic					$19,000,000

* Some returns yet to be received.

(a) Quantity marketed, except when otherwise specified. Tons of 2,000 pounds.

(b) Copper contents of Canadian ores at market value of 15 cents per pound.

(c) Nova Scotia gold is calculated at $19.50 per ounce, and that from British Columbia at $17.

(d) The amount of ore here given was partly marketed as such and partly smelted in Canada, producing the amount of pig iron given in the next item.

(e) Lead contents of Canadian ores at a market value of 4½ cents per pound.

(f) Nickel contents of matte shipped from Sudbury at 75 cents per pound.

(g) Oven coke, all the production of Nova Scotia.

(h) These figures are calculated from the inspection returns at 100 gallons crude for 88 gallons refined oil, and are computed at $1.18 per barrel of 35 imperial gallons. The barrel of refined oil was assumed to be 42 imperial gallons.

The following items have been omitted from the present summary which were included in that of last year, viz.: Charcoal, iron and steel, and the value of pig iron produced from Canadian ores, which amounted in all, last year, to $3,711,316, and must be taken into account in making comparison.

THE IMPERATORI PROCESS.

A series of tests with the Imperatori direct process has lately been carried out at Brewster, N. Y., under the direction of Messrs. Rossi and Nau, who are the American agents for it. The process, which was fully described in the ENGINEERING AND MINING JOURNAL, vol. L., p. 305, consists essentially in adding to the molten pig iron in the open hearth furnace briquettes of fine iron ore mixed with coal. The coal reduces the ore, nearly the whole of whose iron is recovered. The tests recently made have been carried out under somewhat disadvantageous circumstances, as the concentrates used were produced at the magnetic separator at the Croton iron mines at a time when the roasting capacity of the separator plant was inadequate, so that the sulphur content of the ore was too high for the process, and was much higher than the concentrates now being shipped. Charge No. 6 consisted of three thousand lbs. pig iron containing 3,000 lbs. iron; 3,000 lbs. old ingots containing 1,734 lbs. iron; 1,266 lbs. scrap iron (deducting 6%) containing 1,190 lbs. iron; 3,350 lbs. ore briquettes containing 1,715 lbs. iron; 250 lbs. Mokta ore containing 138 lbs. iron; 155 lbs. ferro-manganese containing 155 lbs. iron; 50 lbs. lime; total in metal, 7,932 lbs. iron.

According to Mr. J. B. Nau, of New York, in the *Iron Age*, the product was 6,643 lbs. of good ingots and 563 lbs. of scrap, thus showing a loss of 726 lbs., or 9·16%. If, however, no deduction be made for rust on scrap, etc., the loss figures out 10%. The magnetite ore carried on an average 64% of iron and about 1% of sulphur, while the pig iron held 0·059% of phosphorus and 0·024% of sulphur. The briquettes were made of a mixture of 100 parts of ore, 25 of coal and about 1 to 1·5 of lime. They were mixed by hand and pressed in special molds, and were dried for about 10 days. The time required for the charge was 7½ hours, only one heat being made in 24 hours, no night work being done.

Mr. Nau makes the following computation to get at the loss of iron from the ore charged:

Charge.

	Lbs.	Lbs.		Lbs.
Pig iron	3,000		Total yield in iron	5,649
Old Ingots	1,734		Total steel obtained	7,206
Total	4,734		Iron yield of ore	1,557
Ordinary loss, 7%	331			Lbs. iron.
		4,403	Ore used in briquettes, 2,680 lbs. @ 64%, containing	1,715·20
Scrap (small)	1,266		Mokta ore, 250 lbs @ 55%, containing	137·50
Loss, 12%	152			
		1,114		
Ferromanganese	155			
Loss, 15%	23			
		132	Total iron in ore	1,852·70

The total amount of ore, if Mokta ore is transformed into its equivalent at 64%, is 2,894 lbs., which ore yielded 1,557 lbs. of iron, or 53·80%. Since the ore carried 64% of iron, the yield was 89·8%.

Acceptance of Charter.—The grant of a charter by legislative act to persons named as incorporators does not of itself create a corporate body. it must be shown either by the act itself or by other proof that the corporators applied for the charter or afterward accepted it. A corporation must dwell within the state by which it was created, and can perform no strictly corporate acts without the boundaries thereof. Therefore, where corporators to whom a charter is granted by one state assemble in another and pass resolutions of acceptance, and there perform all the acts necessary to organize the corporation, such acts are void, and the corporation has no legal existence.—*Smith v. Silver Valley Mining Company, Court of Appeals of Maryland*, 20 *At. Rep.* 1,032.

Alabama Coal Fields.—The three principal coal fields of Alabama, said Mr. C. R. Claghorn in a paper read before the Engineers' Club of Philadelphia on the 4th ult., are the Warrior, Cahaba, and Coosa, of which all exhibit a southwest pitch or slope. The special features of the Warrior field, 7,810 square miles in area, are, first, a tendency in all coal seams to thin going northwest from the southeast outcrop, a line of average thickness crossing the field diagonally in a northeast and southwest direction; second, an increase of hardness in the same direction with a corresponding decrease of coking properties, so that the typical coking and smithing coals are mined along the southeast outcrop, while the best domestic and shipping coals come from the center and west; third, a nearly constant chemical composition, commercial lots averaging fixed carbon, 55% to 63%; of volatile matter, 28% to 34%; ash, 5% to 10%, and sulphur, 0·5% to 2%. The moisture in all Alabama coals is low. The Cahaba field as at present developed produces the best "all around" fuels in the state, but in the northern end of the basin the coal appears dirty and slaty, and the productive areas in the south end are quite limited by reason of high dips and the broken and disturbed condition of the measures. The Coosa field has only two active operations, which, in point of production, are of minor importance. The coking coals of the district will naturally continue to be drawn from the present developed areas. The needs of the district for domestic and steam coals will best be subserved by the construction of a north and south railroad from Tuscaloosa, passing through the heart of a rich coal area, where the measures are thickest and coals situated favorably for economical mining.

PROMINENT MEN IN THE MINING INDUSTRY.

Arthur Macy.

Three weeks ago many of our readers were deeply grieved to learn of the death of Arthur Macy, which occurred on the 14th of April, at San Rafael, Cal. His illness had been for many weeks the subject of anxious solicitude on the part of his friends, who numbered a host, in all parts of the country, yet few of them had anticipated its sad termination, so that the news of his death came like a shock. His death is mourned by his friends as the loss of a kind, true, and noble gentleman; by the whole mining industry as the loss of one of the ablest and most promising mining engineers of the day; and by everyone as the loss of a man in every way most worthy of admiration and respect.

Arthur Macy, the son of Josiah G. Macy, of New York, was born on March 17th, 1852. After studying for several years at the College of the City of New York, he entered the School of Mines, Columbia College, and graduated in 1875, with the degrees of civil engineer and bachelor of philosophy. He remained at the School of Mines during the autumn and winter following his graduation, filling the position of assistant to Dr. P. de P. Ricketts, in the department of assaying, for the period of six months. He then became chief engineer of the Ontario Southern Railway Company, and was engaged in active construction work and the improvement of harbor terminals until the company met with financial embarrassment and was obliged to discontinue these operations. After this, he served as assistant superintendent of the Pennsylvania Lead Company for six months, being succeeded in this capacity by the late Francis C. Blake. The two years following, Mr. Macy spent as superintendent of the King's Mountain Mining Company, of North Carolina. Here, while still a young man, he displayed the ability in the conduct of mining operations, which won him success when afterwards directing undertakings of far greater magnitude. Once, when opening out from a new shaft which he had sunk, water standing in the stopes of the old mine broke through into the new workings, filling the shaft to a height of over 200 feet. Mr. Macy unwatered the mine in less than three months at surprisingly small expense, and worked the mine successfully afterwards. Only last winter he was engaged to revisit this property and make a report upon it, when he was much amused and at the same time much touched by the manner in which he was remembered by many of the negro miners, who had worked there in his time.

ARTHUR MACY.

In 1880 Mr. Macy was called to the superintendency of the Pride of the West Consolidated Mining Company, operating near Silverton, Colo. He was able to remain there, however, but a short time, being taken ill with a severe attack of rheumatism. He was carried out of the mountains by his friends, who feared that they would never get him over the range alive, and it was this illness which brought on the affection of the heart which finally caused his death. Suffering untold agony, which he bore with Spartan-like fortitude, he was obliged to go to the Hot Springs, Ark., and even then one physician informed him that the rheumatism had gone so near his heart that he could not live a year.

In the early spring of 1881, Mr. Macy had so far recovered that he again ventured into the San Juan country, and during that year and the following, served as superintendent of the Silver Mountain Mining Company. In the spring of 1882 he was also engaged as constructing engineer and manager of the Martha Rose Smelting and Mining Company, whose lead smelting works he designed, built, and put in operation. A severe recurrence of rheumatism then forced him to again leave the mountains.

After the fulfillment of a special commission in Idaho in the spring of 1883, Mr. Macy accepted the superintendency of the Silver King Mining Company, of Arizona, in the following summer, and conducted the operations of that company for the five and a half years ensuing. His record at the Silver King is well known. It was a model of able, intelligent, and conservative mine management, typifying the best practice in American mining engineering; and it is gratifying to note that his earnest efforts were rewarded by success. From this property he took about four and one-quarter million dollars worth of silver, paid $675,000 in dividends, and upon withdrawing from the company left an abundant surplus in the treasury—a splendid record in consideration of the many natural obstacles which had to be contended against. The manner in which several of these were overcome will serve as illustrations of Mr. Macy's capacity. Among other difficulties at this place was the lack of sufficient water with which to carry on extended operations. Mr. Macy finally solved the problem by the ingenious device of intercepting a strong subterranean stream by a submerged dam and siphoning the impounded water, a distance of three miles, to the mills. So far as we know, this was the first application of this idea. Another difficulty which had to be surmounted in the successful operation of so large an enterprise in such a location was the scarcity of fuel. Such cord wood as the country afforded was not only nearly exhausted, but the government interdicted further cutting of timber, and brought suit for damages for that which had been used. A thorough and careful trial of various coals showed that this form of fuel was out of the question on account of the cost. By a radical change in engines, however, Mr. Macy eventually succeeded in economically introducing crude oil from Ventura, Cal., as a steam-fuel, although it was necessary to bring it over five hundred miles by railway and fifty miles across the desert by teams.

At length, Mr. Macy's health requiring him to take absolute rest, he returned to New York late in the autumn of 1888, and remained there, making occasional trips to examine and report upon various mining properties, until the spring of 1890, when he was asked to investigate and take hold of the embarrassed affairs and more or less wrecked property of the Standard Consolidated Mining Company, in Bodie, Mono County, Cal. He was engaged upon this work at the time of his death.

As manager and superintendent of the Standard Consolidated Mining Company, Mr. Macy bid fair to surpass his achievements as superintendent of the Silver King. After carefully studying the condition of affairs at the Standard Mine, he decided to make radical changes in the method of treating its ore. He discontinued the use of the pan mill, and put in copper amalgamating plates and concentrated the tailings on frue vanners, thus materially decreasing the expense of treatment, and making it possible to work the ore at profit. Even in the short space of eleven months that he held this position he had brought the company to a paying basis.

In concluding this sketch of Mr. Macy's life, we cannot describe his character so well as with the words of one who knew him best: "Wherever Mr. Macy went he made warm friends, and all who were associated with him in business, whether employers or employés, admired and respected him greatly. His men were always loyal to him, and many of them, when they could, would follow him from place to place. Though he was at Bodie, his last place, but eight months (he held the position eleven months), he had won the sincerest admiration and respect of the employés. After his death, the foreman of the mine wrote the vice-president of the company that in all his experience of twenty years he had 'never met so able a man, and one who was so much liked and respected.'

"He had already risen high in his profession, and had he lived he would undoubtedly have taken rank among the best mining engineers and metallurgists of the day. I visited him during the last year at Silver King, Arizona, where the people looked upon him as a perfect genius, and heard things of his ability that would not be said in his presence. He

was not only so highly educated and his technical knowledge great, but he could think and plan new things, and go out of the beaten track with marked success.

"I considered him excessively zealous and most conscientious; there was never a thought of himself or his physical welfare in any undertaking, and I look upon his life as almost sacrificed to his profession. Knowing he had heart trouble he kept it to himself and was about to return to Bodie, even though he had been warned against so doing (simply because he had felt that he had not *quite completed* what he had promised the stockholders he could and would do) when illness overtook him, and, after five weeks, of intense sufferings, borne most heroically, he died of mitral disease of the heart caused by the rheumatism brought on by exposure ten years before in Colorado."

"His was an exceptional character. Brave, grand, unselfish and noble, yet modest, refined and retiring. He was beloved by all whose good fortune it was to know him."

THE JEFFREY CONVEYOR FOR HOT ORES FROM ROASTING FURNACES.

In the accompanying cuts we illustrate an ore conveyor embodying several novel features, which was recently designed and built by the Jeffrey Manufacturing Company of Columbus, O., for the Croton magnetic iron mine, at Brewster, N. Y.

The machine consists of a series of buckets arranged in the form of a polygon, and so constructed as to run on a circular track, the frame of the machine and the track being concentric with and surrounding the roaster tower.

In operation, the roasted ore is raked from a kiln and is loaded on the conveyor as the buckets are passing around the tower, the machine traveling on with its load until the loaded bucket is brought to the delivery point, when it deposits its load by means of a simple, automatic

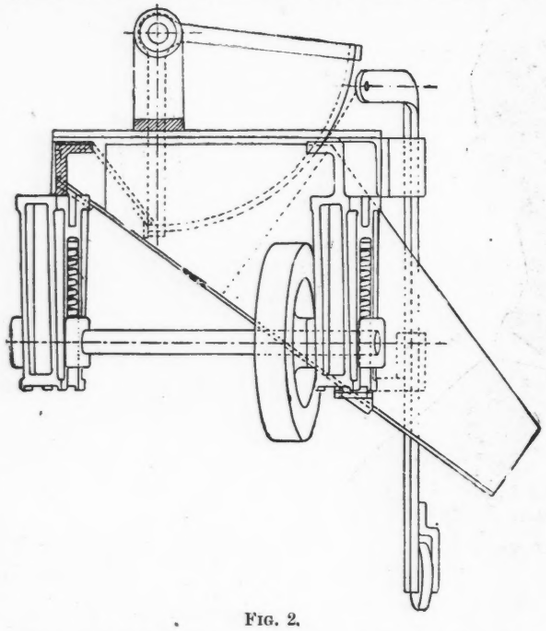


FIG. 2.

trip. The side of the bucket, which is a quarter circle in section, is raised so that the ore falls out by gravity. Each bucket is calculated to contain, when fully loaded, about 250 pounds of ore. All the parts of the frame and the arrangement of position of the drive gear are so placed that the heat from the ore will have little, if any, effect from expansion and contraction upon any of the working parts. All the working parts are so protected that no ore can come in contact with, or clog, them in any way.

The driving arrangement of the movable frame will be seen from the photographic view of the conveyor (Fig. 1). The driving chain runs in the form of an eight-sided polygon. By an arrangement of adjusting screws for tightening the driving chain and pulley chain the motion of the machine is kept in a circle concentric with that of the roaster tower. In the construction of this machine the circular track upon which it traverses was arranged with a guide flange, against which small friction wheels impinged for the purpose of guiding the machine in its circular movement. This guide flange has been found unnecessary in practice, however, so efficient has been the manipulation of the adjusting screws.

In Fig. 2 is shown an end elevation of the bucket, and trip arrangement. The trip wheel on the end of the perpendicular rod, shown in drawing, rolls up an incline at the desired point of dumping. This action raises the outer side of bucket, leaving an opening between the slope of the delivery chute and the bucket through which the ore falls into the angular chute projecting from the side of the frame. The bottom of the chutes projecting from the frame is so arranged in relation to the traversing mechanism that it forms a section of cone, all its lines running to an apex from the center of the circle, thus forming a brace sustaining the inner frame in its position. The radial shafts carry one truck wheel each near the outer circle of the frame. These shafts are arranged in boxes, and the frame is supported upon them by springs, as shown. This enables the shafts to line themselves automatically, each shaft with its opposite shaft on the other side of the polygon, thus compensating for any inequalities in the circular track, also preventing any jar or strain upon the frame, rough places or inequalities of load.

Referring to Fig. 1, it will be noted that the eight vertical shafts contained in the drive gear have upon each one two-sprocket wheels. The upper wheels of these pairs are surrounded by a chain to which are connected pulling rods with adjustable turn buckles, one end of said rods being fastened to the chain and the other to the movable frame underneath the delivery chutes. The drive chain proper encircles the lower system of sprockets and is brought out between two of them over idlers to another vertical shaft upon which is placed a bevel wheel meshing into a bevel pinion on the horizontal shaft. The outer end of the horizontal shaft is provided with a pulley to which power is attached. In operation, the motion imparted on the pinion shaft is transmitted to the vertical shaft from the bevel wheel and by the chain encircling the eight driving wheels gives motion to the eight vertical shafts, and in turn transmits their movement to the pulling rods, moving the whole apparatus simultaneously. The pulling rods extend from the pulling chain take power from the motor chain, and are so arranged as to compensate for the inequalities of pull between the shorter diameter of the octagon and the longer diameter at the points over the wheels. It is found that the motion is perfectly true and smooth at all points of the circle, the whole machine really being a large sprocket wheel of 22 feet in diameter, without any central shaft.

This form of conveyor was designed to meet the particular conditions at the Croton mines, although of course it is applicable to any roasting furnace of the type used there. The same principles employed in this machine, however, are used by the Jeffrey Manufacturing Company in the construction of various other types of conveyors intended to run in a horizontal plane—as, for instance, conveyors to distribute coal over a large storage yard from one receiving point along a straight line of bins. Such conveyors are constructed of capacity of as much as 300 to 400 tons per hour, running at a speed not exceeding 75 feet per minute.

THE INTRODUCTION OF PRODUCER GAS AT THE MARSAC MILL, PARK CITY, UTAH.

Written for the Engineering and Mining Journal by C. A. Stetefeldt.

In July, 1890, I introduced producer gas at the Marsac mill of the Daly Mining Company, at Park City, Utah, for firing two rotary dryers and a large Stetefeldt furnace. The fuel used previously was cord wood. Such a radical change became only possible by the enthusiastic support of W. A. Wilson, superintendent of the mill, and the liberality of Mr. R. C. Chambers, who even refused my offer to assume all financial risk. The great success of their plant is now fully established, not only in reducing the expense of fuel, but also by effecting a better roasting of the ore.

The gas is made in a Taylor gas-producer, 7 feet inside diameter, from Rock Springs nut-coal mined in Wyoming. Rock Springs coal is a lignite, the composition of which is shown by the following analyses:

(1). Water, 7·00%; volatile matter, 36·81%; fixed carbon, 54·46%; ash, 1·73%. (2). Water, 7·00%; volatile matter, 36·00%; fixed carbon, 53·30%; ash, 3·50%.

No. 1 is derived from "Mineral Resources of the United States, 1886;" No. 2 is an analysis made by Mr. Wilson.

The Marsac mill reduces per day from 60 to 65 tons of Daly ore. The latter is very deficient in sulphur, and requires a heavy fire in chloridizing—roasting. After roasting, the ore is treated by lixiviation (Russell process.)

The following statistics furnished by Mr. Wilson speak for themselves: Consumption and cost of wood per day, sixteen cords at $5, $80; team and men delivering wood to mill from wood-yard, $5.50; total, $85.50.

Consumption and cost of Rock Spring coal per day, eight tons at $4.75 delivered at producer, $38. The force of men attending to firing of dryers and Stetefeldt furnace has been reduced since the introduction of gas, from six to four; hence, we must add to the net saving the wages of two men, at $3, or $6.

Using wood, it was customary and necessary to keep on hand in the wood-yard, about 3,500 cords, representing a capital of $17,500. Now, with coal, about 150 tons are kept as reserve, representing a value, at $4.75 per ton, of only $712. Difference in favor of coal: $16,788. Considering the risk of having the wood destroyed by fire, this capital should be taken at not less than 10% interest per annum, or $1,678. For 350 working days this would add about $4 80 per day to the cost of wood. Hence, we calculate the net saving per day in favor of gas as follows: Fuel, $47.50; wages, $6; interest, $4 80; total, $58.30.

Of equal, if not of greater importance, is the gain by better roasting of ore since the introduction of gas. Since this subject will be treated in an article by Mr. Wilson, I refrain from discussing it here.

In conclusion I will say, the Taylor gas-producer gives great satisfaction at the Marsac mill. It gasifies much more coal than the quantity claimed for it. In starting it, one difficulty presented itself which, however, would have been encountered with any other gas-producer. Originally it was intended to use a lignite mined by the Home Coal Company, Utah, the mines being located on the railroad between Echo and Park City. With this coal it was impossible to run the producer successfully, the principal reason being that the ashes from this coal consisted of almost pure, infusible silica. They remained in a floury condition on the revolving ash-table, and above the cone introducing air and steam, making it impossible to carry a fuel-burthen of more than 18 inches depth. Under the circumstances, gas of very poor quality resulted, containing more CO_2 than CO, and the light ashes together with fine coal-dust (the Home coal being very tender) were carried forward into the gas-conductors, causing frequent stoppages for cleaning. With Rock Springs coal, cleaning of the pipes is necessary only once a month. The infusibility of the ashes might have been corrected by addition of fluxes, for instance, soda; but this was not even attempted, because the difference in price between the Wyoming and Utah coal was not sufficiently large to warrant this expense and trouble.

It took some time before we could convince the Taylor Gas-Producer Company why we could not run its producer on Home coal, most likely because this experience was unique. I would advise engineers to test the quality of ashes of coal at their disposal, and then select the one that will produce ashes not infusible, but slightly sintering at a high temperature, if they want to run a gas-producer with no difficulty whatever.

THE SERVE RIBBED BOILER TUBES.

An exhibition test of the Serve ribbed boiler tubes, described in the ENGINEERING AND MINING JOURNAL, Vol. L., p. 575, was recently made at the works of Samuel L. Moore & Sons Co., Elizabeth, N. J., for the purpose of making a comparison between its efficiency and that of the plain tubular boiler of ordinary use.

The boiler in use for test purposes was of the vertical type, 42 inches in diameter and 9 feet 6 inches in height, with sixty-three 2¼-inch tubes. The furnace was 36 inches in diameter, with a 15-inch uptake. The boiler was first supplied with a set of plain tubes, and its efficiency as a water evaporator ascertained; the plain tubes were then removed, a set of sixty-three 2¼-inch ribbed tubes inserted, and its efficiency as a water evaporator ascertained after the change. On the forced-draft trial a pressure of ⅛ inch of water was used, and the boiler evaporated a third more water in a given time when fitted with the Serve tubes than when fitted with the plain tubes. With the plain tubes the pyrometer showed a temperature of the escaping gases exceeding 1,200 degrees Fahr. With the Serve tubes the temperature did not exceed 740 degrees Fahr. The ribbed tubes have about double the heat-receiving surface exposed to the flame that the plain tubes have, while both have the same outside heat-distributing surface.

A test of these tubes reported by Messrs. John Brown & Co., of Sheffield, gives the economy of the ribbed tube over the plain tube at from 11% to 14%. A French admiralty test gave, with natural draft, 15%, and with forced draft, 20% economy in favor of the ribbed tubes. On the steamer "Le Bourbon," of the Compagnie Général de Navigation, Lyons, France, a saving of 24% in coal is reported. This latter company has placed the tubes on eight additional steamers as a result of the "Le Bourbon" test. The French navy is reported as having made a trial of the ribbed tubes, and as having found them perfectly satisfactory. The tubes have been applied to other steamers on passenger lines with promising success. The Paris, Lyons & Mediterranean Railroad Company, after a trial of two years, has adopted the tubes for general use, and is now refitting 40 locomotives with them.

An important test has been made by the manufacturers of these boilers with the following result, as quoted from their own report: "We have proved beyond all question that the ribs in the Serve tubes never become 'red hot,' and we have proved it in the following manner. To test this point, a steel tube was covered inside and outside with an alloy of tin and antimony. This tube was then surrounded with a larger plain one, allowing but ¾-inch water space between the two. A strong blast was kept going an entire day through the ribbed tube horizontally, the flame jet projecting three feet beyond the ends. Upon examination after the experiment, it was found that the heat had made no impression on the alloy, the melting point of which is far below the degree of heat necessary to produce a visible red on iron or steel."

Utilization of the Water Power of Niagara Falls.—The Niagara Falls water power tunnel was definitely located by the board of engineers at a recent meeting held at the company's offices in Buffalo, says the *Engineering News*. It was decided that the portal should be 11½ feet above the average water level of the lower river, and that from this point the tunnel should be carried on an up grade of 0·4% (4 feet per 1,000). The route as first decided upon was to run from a point 20 feet below average water level of the lower river with the same grade. The tunnel according to the present course will penetrate limestone rock mainly, with occasional layers of slate.

The Fineness of Gold.—A sample of Australian gold, says Dr. Willis E. Everette, has analyzed as high as 99% gold and the remainder silver, with iron and copper. Again, a sample of gold from Transylvania contained as high as over 38% of silver. But the average purity of the gold found all over the world is about 85 parts gold and the remainder silver, with iron and copper in greater or less quantities, together with the traces of the rarer metals. The average fineness of California gold is about 88% of gold. The average of Australia is about 92%; of the best grade of Nova Scotia, 97%: of Chili, the average is about 82%; of Russia, 93%. And thus all gold found in any country has so far shown by actual analysis, that it contains more or less silver intermixed with it as an alloy in various proportions, and also nearly always is found contaminated with iron and copper, and sometimes with traces and even appreciable amounts of palladium, rhodium, osmium, iridium, etc.

The Donald Process for the Manufacture of Chlorine.—The Donald process for the manufacture of chlorine, for the production of which works are now being established in England, is thus described by *Industries*. The new process is the same as the Weldon in the first and last stages, viz., the saltcake furnace and the bleach chambers. It is in the second stage, and in dealing with the hydrochloric acid in the gaseous state, that the Donald process seeks to effect improvements, combining economy with efficiency. The hydrochloric acid gas as it issues from the saltcake furnace is not liquefied as in the Weldon process, but is conveyed in a gaseous state through a series of tanks containing nitric acid, by which the chlorine (the whole of it) is eliminated, and passes on, pure and dry, direct to the bleach chambers. There is therefore practically no loss of chlorine, and consequently, for the present make of bleaching powder, less than one-third of the present consumption of raw material will be required. The acids employed are not deteriorated by use, and can be used over and over again with only a small percentage of loss. The plant required is simple and inexpensive, and, the action of the nitric acid being speedy and direct, the process may be arranged to give a continuous yield.

Improved Method for the Manufacture of Soda-Alum.—An improved method for the manufacture of soda-alum, invented by Messrs. F. M. & D. Spence, of Manchester, England, is thus described in the *Journal of the Society of Chemical Industry*: One part of saltcake is dissolved by the aid of live steam in a boiling solution of five parts of alumino-ferric cake of 1·3 sp. gr. The solution is run into a leaden tank and allowed to settle for about 20 hours. The clear liquor is then drawn off and concentrated to about 1·45 sp. gr. by means of high-pressure steam. In using aluminum sulphate instead of alumino-ferric cake, the density of the concentrated liquor should not exceed 1·425 sp. gr. The clear liquor is run into shallow coolers, and occasionally agitated with wooden rakes. The cooling of the liquor is thus greatly promoted, and when the temperature is sufficiently low the whole mass solidifies to a magma. This magma will remain unchanged if left to itself; occasional working up with wooden spades, etc., however, causes it to deposit crystals of soda-alum. These are separated from the mother-liquor, and may be washed with the mother-liquor of the second crystallization, redissolved, and treated in the same way as the original liquor. In evaporating the mother-liquor from the first crystals to 1·45 sp. gr. a further quantity of soda-alum will be deposited; the mother-liquor may also be utilized for the purification of sewage or for the production of potash or ammonium-alum.

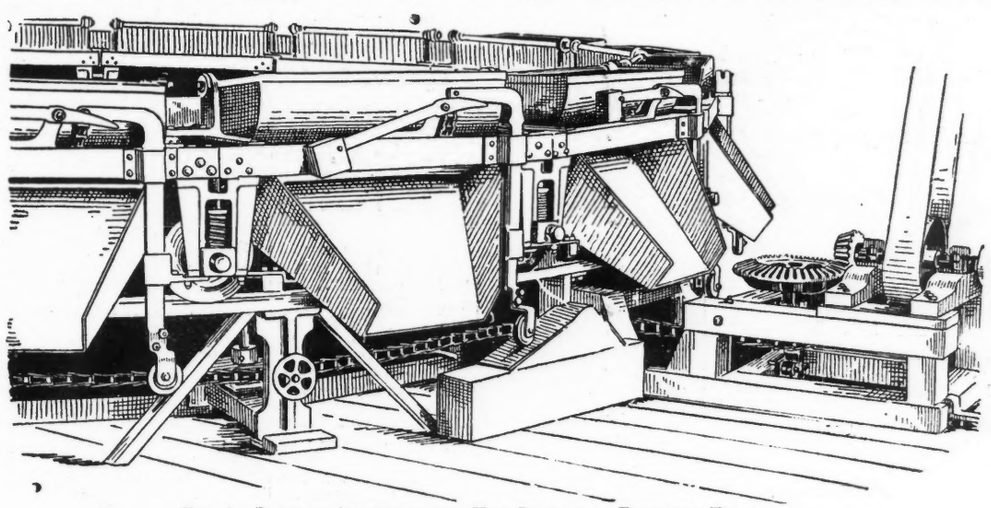


FIG. 1.—JEFFREY CONVEYOR FOR HOT ORES FROM ROASTING FURNACES.

The Purification of Water for Industrial Purposes.—M. Zabrowski describes in the *Bulletin des Fabricants de Papier* and *Chem. Trade's Jr.*, 8. 39, two new methods for the softening of water for industrial purposes, which are stated to give satisfactory results. In the first process hydrated baryta is placed in a filter press which is traversed by the water to be purified, and produces an effluent, showing only one degree or two degrees of hardness. Hydrated baryta, which is now largely used in sugar refining and is easy to procure, precipitates all the bases, lime, magnesia, etc., as well as the sulphuric and carbonic acid, so that the carbonates and sulphates of lime and magnesia, which are the most harmful substances, are precipitated by one treatment. According to the other process, hydrated oxide of lead is employed instead of baryta and precipitates the carbonates, sulphates and chlorides. It is necessary to obtain the hydrated oxide of lead cheaply, and the following ingenious method has been devised by Villon for this purpose. A solution of sodium nitrate is placed in a vat, divided into two compartments by a diaphragm: lead electrodes of large surface are placed in the solution and the current from a dynamo then passed through. The sodium nitrate is decomposed caustic soda being formed in the negative compartment and nitric acid at the positive pole, from which it dissolves a certain quantity of lead, forming lead nitrate. When the current has passed through the liquid for a certain time the solutions are run from the two compartments into a second vat and there mixed by means of an agitator. The soda precipitates hydrated oxide of lead and itself forms sodium nitrate; the solution is then filtered, and the nitrate solution again submitted to electrolysis. When the baryta or lead oxide is used up it is replaced by freshly prepared oxides. The purification by barytes is more perfect than that by lead oxide. According to Villon, the use of the filter press can be avoided by employing plumbate of sodium (a solution of lead oxide in caustic soda). The precipitate is simply allowed to settle out, and the water obtained shows a hardness of about 2° or 3°.

PERSONALS.

Otto F. Pfordte, Mining Engineer, who has been in Peru and Bolivia for a year on professional business, has returned to this city.

Mr. Chas. M. Rolker, consulting mining engineer of this city, has gone to South Africa, for a long trip. Mr. E. E. Olcott has taken the office formerly occupied by Mr. Rolker.

Mr. E. H. Russell, of Park City, Utah, has gone to Butte, Montana, to superintend the experiments which the Bluebird Mining Company, Limited, is to make with the Russell process for the treatment of its ore.

Mr. J. J. Hagerman, of Colorado Springs, Colo., president of the Mollie Gibson Consolidated Mining and Milling Company, has been seriously ill with pneumonia, but is now thought to be out of danger and on the way toward recovery.

C. H. Sinclair, assistant in the United States Coast and Geodetic Survey, has started at Cape May, N. J., to take observations for latitude and longitude, and to determine the general line along the 39th parallel. This survey is being made for a map of the United States which is to be the standard by which all states are to fix their boundaries.

Doctor Francis Wyatt, the well known chemist of this city, has gone to Canada to examine and report upon phosphate properties in the Du Lievre district for a large English corporation. His report will embody a scheme for the mining of apatite and pyrites, and the manufacture therefrom of sulphuric acid and superphosphates and other fertilizers, at Capelton, P. Q.

Mr. C. E. Taylor, of the well known mining firm of Taylor & Rathvon, of Denver, Colo., has been re-elected president of the Colorado Mining Stock Exchange. The other officers elected for the ensuing year were: C. N. Perkins, vice-president; Dennis Sheedy, treasurer; Oney Carstarphen, secretary, and J. M. Calkins, assistant secretary and manager of the Clearing House.

Henry F. Osborn, Professor of Comparative Anatomy, Princeton University, has accepted a call extended to him from Columbia College, of this city, as head of the recently organized Da Costa School of Biology. Prof. Osborn was graduated from the Princeton Class of '77. In 1878 he went to Cambridge, England, where he studied with Adam Sedgewick, and afterward in the London Royal School of Mines with Hewes and under Huxley. He afterward studied in Germany.

OBITUARY.

Thos. H. Bacon died on the 5th inst. at Brookline, Mass., aged 74. He was for 20 years treasurer of the Suffolk Coal Company.

Jerome C. Burnett, chief of the National Bank Division of the Treasury Department, died on the 3d inst., aged 58 years. Mr. Burnett had held the position for 15 years, having been appointed under Treasurer New in 1875.

Charles Pratt, the oil magnate, died suddenly of heart disease in this city on the 4th inst., aged 60 years. At the age of 19 he entered upon his business career with a Boston paint and oil house. Shortly after 1857 he was made junior partner in the firm of Devoe, Reynolds & Pratt, of New York. He shortly afterward went into business for himself and erected a petroleum refinery at Greenpoint. His "astral oil," the product of this plant, soon became a celebrated commodity in the markets of the world. With the formation of the Standard Oil Company his firm, Charles Pratt & Co., was absorbed on favorable terms. He was given an office in the trust and was made president of the Pratt Manufacturing Company. To sell a good article and carry on business on business principles were the ideas governing his life. For 40 years his career was a remarkably successful one. Mr. Pratt was noted for his many charities. As one of the monumental testimonials of his benevolence can be cited the Pratt Industrial Institute, of Brooklyn, N. Y. He devoted much of his time to the institute, which is one of the most complete industrial schools in the country and has been supported by his gifts, which in all amounted to $1,000,000.

SOCIETIES.

The National Association of Machinists opened its third annual convention on the 4th in Pittsburg, Pa.; 175 delegates were present from all parts of the Union, Canada and Mexico. The association has a membership of 22,000, and the craft, working under the nine-hour rule, is said to be content. The name was changed to international to cover the widening scope of the membership. By a vote of 82 to 24 negroes were excluded from the organization.

INDUSTRIAL NOTES.

The Leesport Iron Company's furnace in Berks County, Pa., which has a capacity of 450 tons per week, resumed on the 2nd inst. after eight months idleness.

The American Wheel Company's shops at Sidney, O., were destroyed by fire on the 6th inst. The loss is $100,000, which is covered by an insurance of $60,000.

At a meeting of molders and foundrymen in New York on the 7th inst. it was decided, 327 to 8, to ask for a nine-hours day. Should this be refused, 4,000 men will strike.

The Brooke Iron Company, of Birdsboro, Berks County, Pa., has notified the employés of its nail factory that there will be a reduction in the wages, of 16 per cent. to take effect on the 15th inst.

Five hundred boilermakers in Boston on the 5th inst. resolved in favor of a nine-hours strike on Monday next, but concluded to await a decision of the executive board of the International Brotherhood of Boilermakers.

The New York Smelting and Refining Company's property, at the corner of West and Jane streets, New York, in the hands of Deputy Sheriff Tracy, will be sold out to-day by the Sheriff under executions aggregations over $40,000.

The Jeffrey Manufacturing Company, of Columbus, O., has opened a branch office in Chicago, Ill., at 48 South Canal street. Mr. J. H. Gregg, a practical and thorough engineer of many years' experience in this special line, has been placed in charge.

Messrs. Wm. Ellison & Son, of St. Louis, Mo., were recently forced out of their old location by the railroad people, who have torn down nearly 1,000 buildings in making room for the approaches to the new bridge. The firm is now located on Sixth street.

The Crown and Cumberland Steel Company's trustees, Messrs. Robert R. Henderson and J. Wilson Humbird, have sold its plant and machinery, located in South Cumberland, Md., to Thomas A. Hicks and Wm. C. Dickey, of the firm of Hicks & Dickey, Philadelphia, for $38,600. It is understood that the purchasers expect to operate the works as soon as the sale is ratified, or in about a month.

The annual meeting of the Westinghouse Electric Company, to have been held in Pittsburg, Pa., on the 4th inst., was postponed until the 18th inst. at the request of Mr. Westinghouse. He said that negotiations for a settlement of the financial troubles of the concern were in such shape that it would not be advisable to make a report before that date. The negotiations are said to be in the interest of the holders of the common stock.

The Missouri Malleable Iron Company, of St. Louis, Mo., last week surveyed the ground for a new location in East St. Louis. The works will be located in the new suburb of Denverside, about 1¼ miles from the Illinois end of the bridge, and will occupy a 14-acre tract. Contracts have already been let and the work will be pushed to completion with all possible speed. When in full running order it is said employment will be given to 1,000 hands.

The Bühring Patent Carbon Asbestos Block-filterer, manufactured in Hamburg, Germany, is being introduced to the American public by the United States Water Purifying Company, 10 Barclay street, New York. It is claimed for this apparatus that contact of the water, either during or after filtration, with metallic surfaces or material capable of undergoing decomposition, is, by the nature of its construction, avoided. Neither is there a reservoir in which the water can collect.

Messrs. Carnegie Bros. & Co. will build a double track road from McKeesport to the Braddock and Homestead plants, Pa., for the purpose of transporting hot metal, at a cost of nearly $1,000,000. It is to begin at the Duquesne steel plant, and will parallel the Monongahela River to a point opposite Port Perry, where the river will be bridged to reach the Edgar Thomson plant, and from there it will run to the Homestead plant, a distance of five and a half miles in all. Surveyors are now at work locating the line. It is to be built immediately, and, it is estimated, will pay for itself in two years.

SOUTHERN INDUSTRIAL NOTES.

(From our Special Correspondent.)

The Eagle and Phenix Manufacturing Company, of Columbus, Ga., decided to increase the capacity of its mill and put in new machinery, which improvements will cost about $100,000. The mills are running at their full capacity.

The Jonesboro Iron Works Company has been incorporated at Jonesboro, N. C., for the purpose of purchasing and operating the iron foundry of Kelly, Bros. The incorporators are J. T. Kelly, T. N. Campbell, J. L. Godfrey and others.

The Buckhannon Land Trust Association has been organized at Buckhannon, W. Va., with a capital stock of $500,000. The officers are as follows: C. B. Harte, of Wheeling, president, P. H. Trout, of Staunton, Va., vice-president, and G. A. Newlon, secretary. 1,200 acres of land near the city have been purchased and will be improved. Negotiations are pending for the establishment of manufacturing enterprises, for the construction of which one-half of the capital stock will be devoted.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting Machinery or Supplies of any kind will notify the "Engineering and Mining Journal" of what he needs, his "Want" will be published in this column.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office. No charge will be made for these services.

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

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

GOODS WANTED AT HOME.

2,215. A complete outfit for a towboat, 50 × 12½ feet, twin propellers, 30-inch wheel; also two 5 × 6 engines, and a horizontal boiler, 3-inch tubes, to burn 4 foot wood. Florida.

2,216. A small steam launch; one that can use coal or wood; prefer second-hand, if in good order. Also a 12-inch, 13-inch or 14-inch center crank engine, good second-hand, and a 60 horse-power boiler. North Carolina.

2,217. Gold mining machinery, especially concentrators. Alabama.

2,218. Brick machinery. Louisiana.

2,219. A stamp mill complete. Georgia.

2,220. Canning machinery. Georgia.

2,221. Machinery for "floating ochre dry. Georgia

2,222. Machinery for sugar factory. Tennessee.

2,223. A pair of second-hand assay balances. New York.

2,224. A 15 H. P. boiler and a 20 H. P. engine. Texas.

2,225. Two 60 saw cotton gin stands with condensers and feeders. Texas

2,226. An elevator for cotton. Texas.

2,227. A 20-inch corn mill. Texas.

2,228. Cotton press and elevator. Alabama.

2,229. A spoke lathe. Arkansas.

2,230. A felloe saw. Arkansas.

2,231. A good second-hand 5 foot boring mill. Ohio.

2,232. A complete outfit of machinery for making bark collars, 1,000 capacity per day. Alabama.

2,233. Machinery for the extraction of the fibres of the agave or maguey produced in Mexico and South America.

2,234 A 12 or 15 horse power boiler and engine. Virginia.

2,235. Brick machinery to manufacture brick for erection of houses, etc. South Carolina.

2,236. Building and roofing materials. South Carolina.

2,237. Engines, boilers, woodworking machinery and tools for the manufacture of wagons and buggies. South Carolina.

AMERICAN GOODS WANTED ABROAD.

2,203. Samples and prices of bleached and unbleached cotton, Augusta and Toledo plaids, Canton flannel, suspenders, blue denim of all qualities, twill cotton, hosiery, duck, celluloid collars and cuffs, ticks, J. & P. Coats' spool cotton, singlets, shirtings, Merrimack shirtings, and other cotton goods manufactured in America. West Indies.

2,206. A machine with a capacity of 50 tons per day, to treat or disintegrate tailings from a gold mine that have become caked by exposure to air. Machine to be shipped to Brazil. South America.

2,207. A mill for the fine grinding of pure pyrites. Give full particulars as to capacity of mill, tons per day, cost, power required to operate, description of process, etc. Mill to be shipped to Brazil. South America.

2,212. Mineral wool. Canada.

2,213. A ship for towing purposes. Central America.

GENERAL MINING NEWS.

The news was received in this city during the week that Thomas C. Platt's proposition to sell the Tennessee properties of the Tennessee Coal, Iron and Railroad Company to an English syndicate had been defeated. The stockholders of the company held their meeting in Tracy City, Tenn., to pass on this scheme, and they defeated it by a vote of 59,500 to 30,200.

Horace V. Winchell, assistant state geologist of Minnesota, who is now inspecting the silver and iron districts of Ontario, with headquarters at Port Arthur, writes the Duluth, Minn., *Herald* that the Port Arthur, Duluth & Western road has now its right of way cut through to the Minnesota boundary at Gunflint Lake, and is steadily grading along toward that point. The road is in good condition and has money for all needs. If the Duluth

& Iron Range does not meet it at the boundary line, it will push its own road on to Ely, to which place it has already surveyed an excellent line, running by many valuable properties.

ALABAMA.

CLEBURNE COUNTY.

(From our Special Correspondent.)

MOSS BACK.—This mine which is located in the Arbacoochee section, is now being started up. Mr. J. W. Houston has in operation a 5-stamp mill. He reports that the ore worked at present is what is termed "lean ore" and worth about $3.00 per ton. The vein is said to be 10 feet thick at a depth of 60 feet. The mill is situated at a distance of one mile from the mine. The operating expenses are reported to be as follows: Mining 40 cts. per ton, transportation 35 cts. per ton, stamping 20 cts. per ton, making a total cost of 95 cts. per ton inclusive of interest on the investment and incidentals.

ALASKA.

ALASKA TREADWELL GOLD MINING COMPANY.—The shipments of bullion for the month of April amounted to $65,900. The expenses are estimated at about $32,500. There were 18,525 tons of ore milled and 535 tons of sulphurets treated, $23,000 worth of bullion coming from the latter. The mill ran 27 days.

ARIZONA.

COCHISE COUNTY.

The mill at Tevis camp is being worked again, and it is said that high-grade concentrates are being economically produced. This is a dry concentrating mill. Mr. Duncan, who has furnished the capital for this enterprise, is very well satisfied with the results that have been obtained.

MARICOPA COUNTY.

(From our Special Correspondent.)

SAN FRANCISCO, April 30, 1891.

BONANZA MINING COMPANY.—Developments in this company's properties are giving such an impetus to mining in the Harqua Hala district that the mill, which is now nearly completed, is certain to have all the custom ore it can handle, in addition to the product of the Bonanza mine. Mechanics are putting the machinery for Hubbard's big stamp mill in place as fast as it is delivered. The large arastra of Bloomer, Morris & Co. is running on ore taken from the recent discovery close to the Bonanza mines, and so encouraging is the work done that arrangements are being made to build two additional arastras.

PIMA COUNTY.

(From our Special Correspondent.)

HERMOSA MINING COMPANY.—The Huntington mill is running night and day and working about one ton of ore per hour. The main shaft of the mine is down 475 feet, and most of the work is being done in the lower workings. The property has since its discovery, about 15 years ago, been an almost constant bullion producer, yielding over $1,000,000 in silver. At present it belongs to J. Finley, who has leased it to his former employés. Lately the average value of the ore has increased quite considerably; it is free milling and cheaply worked.

PEER MINING COMPANY.—During the past week a good breast of smelting ore has been exposed in the 100-foot level north, from shaft No. 1, and at the bottom of the shaft, which is down 36 feet below this level, there is a body of ore seven feet wide, all being good milling ore. Preparations for stoping are being made at various points.

WELDON MINING COMPANY.—Explorations have been continued on the 100-foot level of the mine without any change. At some points in the stopes the ore is of very high grade, and is being sacked.

CALIFORNIA.

MONTEREY COUNTY.

(From our Special Correspondent.)

CARMELO COAL COMPANY.—The rails for the company's narrow-gauge railroad which is to connect the mine with tide-water, a distance of four miles, are now on the ground. The hoisting works have been completed at a cost of $40,000, and as soon as the rails are laid steam colliers will carry the coal to San Francisco.

NEVADA COUNTY.

NEW EUREKA MINING COMPANY.—The directors have secured a lease on the Crown Point (Gauthier's) mill for one month. A test will be made of ore from the newly discovered vein, and if it proves satisfactory the company will lay a pipe to secure water power and erect a 10 stamp mill.

SHASTA COUNTY.

(From our Special Correspondent.)

UNCLE SAM MINING COMPANY.—After driving the lower tunnel for 7 months the ledge has at last been cut. This gives 600 feet of stoping ground overhead. The new tunnel is 400 feet below the old tunnel level. The vein is 8 feet wide and the ore is of good grade.

YUBA COUNTY.

SYNDICATE MINING AND DEVELOPMENT COMPANY.—This company has been incorporated to work the Blue Lead gravel mine at Smartsville. Among the directors are J. C. Turner and F. W. Eaton, of San Francisco. The ground on the south end of the Blue Lead will be opened through a tunnel on what has been known as the "Dunn ground," and then work will be extended back into the Mooney Flat ridge.

COLORADO.

BOULDER COUNTY.

COLUMBIA.—Shipments have already been commenced from the new strike made in this mine a fortnight ago. The ore body opened is about seven feet wide, of which three feet is smelting ore.

CLEAR CREEK COUNTY.

BELLEVUE-HUDSON MINING COMPANY.—This company has commenced shipping ore from its new strike. The dispute with the owners of the Homestake claim remains unsettled.

MENDOTA.—The output of this mine in April was 126 tons of ore, valued at $12,038. This property is worked under the tribute system entirely.

MT. MCCLELLAN MINING COMPANY, LIMITED.—The second ordinary general meeting of the shareholders of this company was held in London on the 20th ult. The directors made a report of the affairs of the company covering the period from February 1st, 1890, when it was organized, to December 31st, 1890. The amount of ore sold during the year was close on to 1,100 tons, which averaged in value from $37 to $99.50 per ton. The mine has been operated under the tribute system, the average royalty received having been about 40% on the net value of the ore sold. The working force employed at the mine was increased from 30 men to 70 men during the year. The accounts for this period show a net profit, after deducting £109 for London expenses, amounting to £4,011 and a dividend of 4d. per share, or £2,508 ($12,540), was declared, leaving a balance of £1,503 to be carried forward. The company also had on hand March 4th, the date upon which the last report had been received from the mine, the sum of $4,961, the proceeds of January and February ore shipments, as well as 100 tons of ore unsold. The prospects of the company are considered most encouraging, and it bids fair to become a regular dividend-payer.

EL PASO COUNTY.

HOME MINING COMPANY.—This company has made a shipment of two tons of cryolite, which is to be used to test the quality of the mineral recently discovered in the company's property.

FREMONT COUNTY.

COLORADO ALABASTER COMPANY.—This company has been organized to work the deposits of alabaster, ten miles east of Cañon City, which were discovered several months ago by Eugene Weston, of Cañon City. The alabaster is said to be of excellent quality and the bed of great extent.

UNITED OIL COMPANY.—Petroleum was struck by this company on the 24th ult. in its well No. 51, at depth of about 2,000 feet. It is said to be one of the largest producers in the field.

GUNNISON COUNTY.

BROKER.—A small streak of very rich ore is reported to have been struck in this mine, which is located on Henson Creek, near Capital City. The property has been worked quite successfully during the past winter by Denver parties who have a lease and bond for $40,000 upon it. It is thought the bond will now be taken up.

FAIRVIEW MINING COMPANY.—A new ore body, four feet thick, assaying high in silver, has been struck in the Fairview mine, which is apparently improving as depth is gained. The main incline is now down 370 feet. The company is working a force of 50 men.

NEST EGG.—A promising strike was recently made in this mine, and a dritt has been driven nearly 50 feet in the ore, which assays over 100 ounces of silver per ton and 50% lead.

ORPHAN BOY MINING AND REDUCTION COMPANY.—At the annual meeting of this company held in Denver on the 25th ult., Edmund B. Curtis was elected President; Clarence E. Curtis, Secretary, and Asa M. Daniels, Manager. The company proposes to do considerable development work upon its property in the Chrystal River district during the coming summer.

RUBY KING.—Work has been resumed in this property, located in the Irwin district, after an idleness of nine years. The mine was formerly well known as a producer of rich silver ore. It is now to be operated under the management of Col. Theo. H. Lowe, of Colorado Springs, by a syndicate of Colorado Springs and Denver capitalists, who have secured a bond and lease upon it for two years.

JEFFERSON COUNTY.

DENVER COAL COMPANY.—This company struck a bed of coal 6½ feet thick in its mine north of Golden, on the 1st inst. The coal is said to be an exceptionally fine lignite.

OURAY COUNTY.

GENESSEE-VANDERBILT MINING COMPANY.—The cross-cut to the vein is now being driven with two air-drills, and has to go but 200 feet further to reach the objective point.

HUMBOLDT.—Work has been prosecuted in this mine throughout the present winter and 100 tons of high-grade ore are now ready for shipment. The shaft has been sunk 100 feet and the second level opened for 400 feet on the vein, showing a continuous streak of ore from six to eight inches in thickness.

PORTLAND MINING AND REDUCTION COMPANY.—This company has been incorporated by F. M. Endlich, H. C. Dickinson and P. L. Bockfinger, with a capital of $100,000, to erect an amalgamating mill at Portland for the purpose of reducing the low-grade ore of the Slide and other Camp Paquin mines.

WHEEL OF FORTUNE.—Butler, Bell & Co., lessees of this mine, have sunk a shaft 50 feet below the old works and are driving drifts both ways from the bottom. A breast of pay ore, two feet wide, is showing in both drifts, about eight inches of the streak assaying as high as 400 ounces silver per ton. Regular shipments will be commenced at once.

PITKIN COUNTY.

PONTIAC MINING COMPANY.—The protest in the Land office entered by Mr. B. Clark Wheeler against this company, in the case of the Snowstorm No. 2 mine and the Rainstorm No. 2 claims, has been compromised. Mr. Wheeler deeds the company portions of the Joplin, Iowa, and Cascade claims, and receives 550,000 shares of the treasury stock of the company. Mr. Wheeler also agrees to advance the company $15,000 as working capital. The company receives the right to work, for one year, through the Iowa and Empire shafts. The machinery at the Belfont shaft has been removed to the Iowa, and work already commenced at the latter. A drift has also been started southward, with three shifts of men, from the bottom of the Empire shaft. Mr. B. Clark Wheeler has been elected to the board of directors, of which Mr. J. B. Wheeler remains president; Fred. Brown, secretary and treasurer, and J. L. Brown, manager.

ST. LOUIS AND COLORADO SMELTING COMPANY.—The new works of this company at Thomasville are practically completed and it is expected that the furnaces will be blown in on the 12th inst. The power for the works is furnished by two large Pelton wheels, and the furnaces have a capacity of reducing 75 tons of ore per day. This company, in which St. Louis capitalists are largely interested, expects to draw ore mainly from Aspen and Rock Creek mines, Thomasville being located on the line of the Colorado Midland Railway. The Cardiff coke ovens are not far distant, and there is an ample supply of lime-rock near at hand. The principal difficulty, however, will be a sufficient supply of lead ore.

STANDARD MINING COMPANY.—The application of this company for an injunction restraining the Cowenhoven Mining, Transportation and Drainage Company from driving its big tunnel into Smuggler Mountain, has been abandoned. The case against the Della S. Mining Company is still being pushed.

GEORGIA.

(From our Special Correspondent.)

The Piedmont Exposition to be held at Atlanta will offer among its prizes the following: "Fullest and best display of minerals from any state and county in Piedmont region, $100; second premium, $50. For the display of minerals of any state or county that is made most attractive in a unique and artistic manner, $50."

LUMPKIN COUNTY.

(From our Special Correspondent.)

DAHLONEGA GOLD MINING COMPANY, LIMITED.—The case of the Hall Merchandise Company against this company has been tried and a verdict rendered for the plaintiffs for about $11,000, the full amount sued for. This suit was brought on the contract for constructing and repairing the Cane Creek ditch, and an open account due plaintiffs for supplies furnished. It is understood that an appeal will be taken. Marshall A. Philips, a large stockholder in the company, has been in Dahlonega looking after the matters of the company; and if they can be satisfactorily adjusted mining operations will be resumed at once.

POLK COUNTY.

(From our Special Correspondent.)

STANDARD RAILROAD COMPANY.—This company has been organized with a capital stock of $250,000. The officers are: J. H. Reynolds, president; and W. L. Hilkman, vice-president. Its purpose is to develop mineral properties in this county.

IDAHO.

ADA COUNTY.

WASHINGTON.—The silver vein in this mine, near Boise, continues to increase in richness as the drift on the 200-foot level is extended east. This is 600 feet on the vein from the croppings, and all the ore above is yet in place. The gold vein is worked out from the 200-foot level of the shaft to the croppings. The shaft now, however, is 300 feet deep, and the station at the lowest level is being cut out. As soon as this is completed cross-cutting to both veins will be commenced.

ALTURAS COUNTY.

BUFFALO.—Fifteen men obtained a lease on this mine last winter and have since taken out a large quantity of ore. It is not free milling and will be shipped east for reduction. This property was at one time one of the greatest silver producers in Idaho. At a depth of 600 feet the ore became low grade, and the company, many years ago, suspended operations. After this, all claims on the

Atlanta lode were bonded, and have been re bonded a number of times; but a sale has never been effected, as the price has always been placed too high. According to reports, $2,000,000 had been asked.

GLENGARIFF.—A breast of ore 14 inches wide, assaying 600 ounces silver per ton, is said to have been uncovered in this property.

MAYFLOWER.—Some leasers recently made a strike in this mine at Bullion. They have eight inches of ore that runs 400 ounces silver. This has been drifted on and so cut as to show for 56 feet, while the rich ore still goes down. The ore is three feet wide, one-half of which is first-class and the other half good jigging ore. There are about 140 tons of ore out ready to ship. The Mayflower belongs to Mr. Farwell, a Chicago capitalist.

CUSTER COUNTY.

CLAYTON SMELTING COMPANY.—These works are being enlarged by the addition of another stack of 60 tons capacity, thus just about doubling the size of the smelter. The mines are said to be in first rate condition, and promise to be able easily to supply the smelter with the necessary ore.

SHOSHONE COUNTY.

BUNKER HILL AND SULLIVAN MINING COMPANY.—The new mill this company has recently erected has an ore bin capacity of 4,000 tons, and the concentrate bins, six in number, will hold 800 tons. The machinery consists of two trough conveyors, each 100 feet long; two incline trough conveyors 40 feet in length; two feed hoppers with a capacity of 20 tons each; eight sets of improved Cornish rolls; eight belt elevators and 10 separating screens; 28 jig machines; three double deck Evans tables and six fine vanners. The entire works are run by water, which is conveyed from the mouth of Elk Creek, a distance of nearly three miles, and gives about 1,000 horse-power, with a fall at the mill of 58 feet. Four Leffel wheels are in use; two 17½-inch for the mill, one 10½-inch for electric light plant, and one 13½ for the incline tramway. This last addition, now in course of erection, will be 247 feet in length and will connect with the Bleichart tramway for the purpose of transporting timbers and all kinds of freight to the mines. Special cars will be side-tracked on the Union Pacific to receive the concentrates. The capacity of the concentrator is 400 tons per day, and at present there are 4,000 tons of crude ore in the bins and 60 tons of concentrates. The plans of the building were drawn by Robert Cheyne, and the machinery has been furnished by the Chicago Iron Works, Fraser & Chalmers, and the Link Belt Machinery Company, all of Chicago.

WASHINGTON COUNTY.

The citizens of Meadows recently had a meeting to discuss the feasibility of opening a wagon road from there to the Seven Devils. There are two routes—one via Price and Lost valleys, and the other direct from Meadows in a northwest direction across the headwaters of the Little Weiser. The wagon road to the Seven Devils mines from Baker City is now an assured fact. As a result of a conference between the Union county authorities and C. W. James, the former have agreed to pay to the road committee $1,500 as soon as the road is completed. It was understood that $1,500 would not be sufficient, but that Baker City and the people along the line of the proposed road would furnish the necessary balance. Mr. Moulton, the General Manager of the Road Committee, left Baker City recently with men, teams and implements, and expects, by pushing the work, to have the road in a passable condition about the 15th of May.

AMERICAN MINING COMPANY.—The principal claims owned by this company are the Helena, Peacock and White Monument, all of which show great bodies of copper ore, with sufficient gold and silver to leave the copper clear profit. In addition, the company owns the Blue Jacket Group, consisting of seven claims. A full description of some of these properties was given in our issue of November 22d, 1890. It is now reported that the "Norma" has not been able to make her trip on the Snake River, as the water is not yet at proper stage. From 3,000 to 4,000 tons of high-grade copper ore are said to be on the various dumps, and will be shipped to the smelter as soon as navigation opens. Some Western parties have contracted to erect a smelter on the ground, and it is thought work will now soon be commenced. Mr. Kleinschmidt, the president of the company, says the Seven Devils country is splendidly watered, there being streams all over it. There is also an abundance of wood for timber and fuel. On the other side of the range from the American Company's property is a district rich in gold and silver. The ore is a gray copper, and while the leads are small, they are very rich.

ILLINOIS.

A dispatch from Chicago says that there is every prospect that the action of the North Illinois operators in refusing to grant the request of the miners' representatives for a conference to settle the question of wages will be followed by a general strike of all the miners in that district. Ten thousand miners are employed in the Northern coal fields.

IOWA.

BOONE COUNTY.

The miners of the Boone coal fields at Boone have signed contracts fixing the price of mining for the next year at $1 per ton. No demand for an eight-hour day was made.

KANSAS.

A special report shows that during the week ending May 2d the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,586,340; zinc ore, pounds sold, 585,000; lead ore, pounds sold, 192,060; sales aggregated a total value of $10,650.

MICHIGAN.

COPPER.

The first water shipment of refined copper was made on the 4th inst. 400 tons being sent from Hancock to Buffalo on the steamer "Empire State."

ATLANTIC MINING COMPANY.—The production for April amounted to 220 tons of mineral, against 184 tons during the same period last year.

CALUMET & HECLA MINING COMPANY.—The Red Jacket shaft is now down 2,470 feet. Sinking was stopped some time ago, and a crosscut started at a point 2,460 feet down toward the old workings, or the mine proper. The company produced 3,455 tons of mineral in April, against 3,744 tons in the same month last year.

COPPER FALLS MINING COMPANY.—This company produced 85 tons of mineral during April.

FRANKLIN MINING COMPANY.—The production of mineral in April amounted to 202 tons, against 208 tons in the same period in 1890.

HURON MINING COMPANY.—The company's production in April amounted to 100 tons of mineral.

KEARSARGE MINING COMPANY.—This company's output was 86 tons of mineral, against a similar tonnage for April of 1890. The company has ordered a hoisting plant for deep mining, and will proceed to erect a building for the same at once.

OSCEOLA CONSOLIDATED MINING COMPANY.—This company's output of mineral for April amounted to 300 tons, against 235 tons for the same time in 1890.

QUINCY MINING COMPANY.—This company's production of mineral in April amounted to 502½ tons, against 401 tons in the same month last year. For the first four months of 1890 the total mineral product was 1,909 tons, against 1,371 tons last year.

IRON—GOGEBIC RANGE.

NORTH PABST.—Ore has been struck in the shaft at this mine at a depth of 475 ft. It comes in from the south; dips to the north and east. This is the ore body that was struck by a diamond drill worked from the end of a 300 foot shaft. It was found to be 40 feet through.

UNION IRON MINING CLMPANY.—This company, with a capital stock of $50,000, has been formed by the consolidation of the Progressive, Penokee, Central and Sampson iron interests. Ashland, Wis., and Minneapolis, Minn., capital is chiefly interested.

IRON—MENOMINEE RANGE.

LUMBERMAN'S MINING COMPANY.—Last week the shaft-house at "A" shaft at the Ludington mine, together with the trestles, ore pockets and other adjuncts, was destroyed by fire. A new shaft-house with improved ore pockets will be built at once and it is probable that hereafter skips will be used in this shaft instead of cages. The fire will somewhat retard the work of the mine, but will, it is said, not materially effect the year's output.

IRON—MARQUETTE RANGE.

CHAMPION IRON MINING COMPANY.—The Negaunee *Herald* quotes A. Kidder, general manager, of this company, as saying: "We have 60,000 tons of the product of last year, representing a cost of $240,000, at Lake Erie ports, unsold, and unless there is some better promise than is discernible at present, our people will hardly feel like borrowing money to add to this accumulation, though it is of course desirable to work the mine, and work it strongly, as seems for the best advantage with an ordinary market. I am unable to dismiss some grave misgivings as to the season's business, and can only hope for improvement without being able to give reason for the hope."

DETROIT MINING COMPANY.—An option on this company's property with the privilege of purchase has been given to Messrs. Geo. St. A. Clair, Wm. Sedgwick, W. H. Rood and Chas. Merryweather, all of Ishpeming. The property has been carefully examined and the lessors are satisfied that the showing is sufficient to warrant the expenditure of a certain amount of money in searching for new ore bodies.

MISSOURI.

CITY OF ST. LOUIS.

(From our Special Correspondent.)

ST. LOUIS SMELTING AND REFINING COMPANY.—This company is pushing the replacing of its buildings as rapidly as possible. The recent fire did not delay the operations at the smelter in the least, as the men worked right along even while the fire was raging near them.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, May 4.

There has been no advance in the zinc ore market. It ruled at an average of $22 per ton. Sales have been heavy in Joplin and Carterville. The lead market opened Monday at $23 per thousand and on Thursday advanced to $24, declining to $23.75.

Following are the sales as far as reported:

Joplin mines, 1,728,140 pounds zinc ore and 178,510 lead; value, $22,430.

Webb City mines, 1,032,310 pounds zinc ore and 73,700 lead; value, $13,089.

Carterville mines, 1,899,570 pounds zinc ore and 24,460 lead; value, $21,470.

Zincite mines, 233,680 pounds zinc ore and 480 leads; value, $2,518.

Oronogo mines, 26,910 pounds zinc ore and 10,810 lead; value, $529.

Galena Kans. mines, 585,000 pounds zinc ore and 197,180 lead; value, $10,775.

Districts total; value, $70,811.

Aurora, Lawrence county, mines, 590,000 silicate, 200,000 pounds zinc ore and 230,000 lead; value, $11,300.

Lead and zinc belts; value, $82,111. As can be seen from the reports from this district for the past few months, the zinc ore market has been on a gradual decline, having dropped from $32 per ton. This can only be accounted for by the fact that the purchasing agents representing the different smelters put in a large surplus stock last fall. As this stock is now about exhausted, the prospects are good for an early rise in the ore market.

The noted Bay State lease on 20 acres of the Oswego Mining Company's land has expired by limitation. This has been a wonderful producer of lead and zinc ore from shallow deposits, and many miners have made snug little fortunes from single mining lots. It is understood that the Oswego Mining Company will continue the operation of the property and open it up to a greater depth. The General Manager, Mr. S. C. Cook, has just returned from New York, where he has been for some time on business.

Colonel Tully, who has been developing a tract of land southwest of the city for an English syndicate, suspended operations some time ago. Lately he received orders to resume work. The property adjoins the noted Diamond Mining Company's land on the north.

Collins & Peterson are still pushing development on their Little Nellie mine north of Turkey Creek. They are opening up a new run of ore from which they are producing from three to four tons of clean zinc ore every day.

The Mahusk Lead and Zinc Company, operating just east of the Empire Zinc Company, at Blenckville, is pushing development work, opening up new ground, which is proving up new ore bodies. It is also putting up a new plant of steam hoisting machinery.

NEWTON COUNTY.

(From our Special Correspondent.)

SENECA, May 4.

The Seneca Lead and Zinc Company is now running its new concentrating plant on full time.

Reeves & Mitchell have opened up a fine lead mine on the Luce land at a depth of 45 feet.

Potwin & Holme's mine located south of town is still keeping up its steady production of 4,000 to 5,000 pounds of lead every day.

The Iowa Mining Company operating on the Luce land commenced producing lead last Thursday. The future of Seneca as a steady producing lead and zinc mining camp is now fully established. It is what may be termed a poor man's camp, as the deposits of lead are found at shallow depths, outcropping in some places.

Mr. James Duane Robertson, of the State Geological Survey staff, called at the ENGINEERING AND MINING JOURNAL office this morning. Mr. Robertson is making a trip through the state for the purpose of completing his report on the mineral springs and wells. Prof. W. P. Jenney, of the United States Geological Department, is now in Springfield, and will soon resume work on the geological survey of the lead and zinc belt of this district. It will be pushed to completion as rapidly as possible.

MONTANA.

DEER LODGE COUNTY.

EAST GRANITE MINING COMPANY.—In cutting a station, recently, at the 250-foot level, from the shaft of this company, 18 inches of quartz, assaying 40 to 60 ounces silver per ton, was struck. The discovery was entirely unexpected as it was found 40 feet from the vein and on the south side of the shaft. Mr. Welch, superintendent of the company, is of the opinion that the north vein, which is 200 feet from the main shaft, is no other than the Sunnyside vein recently struck by the Granite Mountain Company. A good deal of water has been encountered in the new East Granite shaft, and additional pumping capacity will probably have to be provided if it is decided to sink further.

LION MINING COMPANY.—At a recent meeting of the stockholders of this company, it was determined to continue the development of the Lion property, and work was commenced on the 15th ult. The mine was recently examined by Capt. J. W. Plummer, and the suggestions made in his report, which was favorable, will be followed. He recommended that the drift on the "middle" lode be driven 400 feet further, at which point it is believed it crosses or unites with the south lode, where, if not before, a body of ore will quite possibly be struck.

JEFFERSON COUNTY.

TACOMA MINING COMPANY.—The Albion, Blue Bird, Golden Gate, Clara Belle, Mogul and Poland claims, in the Elkhorn mining district, were recently sold by J. T. Smith, of Helena, to a party of Tacoma capitalists for $100,000. The purchasers are W. R. Rust, F. W. Black and Richard Briggs, officers of the Tacoma smelter; J. P. Smith, of Helena, and G. W. Boetcher, of Elkhorn. The capital of the company, which will be known as the Tacoma Mining Company, has been placed at $300,000. No officers have yet been elected, but Mr. Charles West will be the geueral manager. The principal work has been done on the Albion, and enough has been done on all the claims to show that they are rich in ore. There are altogether 800 feet of tunnels and levels; about 100 tons of first-class shipping ore is on the dump. The ore is an iron carbonate, carrying lead, iron, gold and silver. An average assay gave $44 in gold, $23.50 silver and $22.50 lead. The property is only about a mile from the Elkhorn branch of the Northern Pacific, and a spur will be built to the mine immediately.

MISSOULA COUNTY.

CURLEW MINING COMPANY.—This company is at present shipping 125 tons of ore per month. New hoisting machinery is now to be put in and the output of the mine will probably be considerably increased.

PARK COUNTY.

PARK COKE AND COAL COMPANY.—Superintendent Rhodes states that the company's plant at Horr is now working to its fullest capacity, and that no trouble is experienced in disposing of all the coke produced. The entire 40 ovens are in use, and it is probable that the plant will be increased by the erection of 40 more ovens during the coming summer. The output is shipped to East Helena.

SILVER BOW COUNTY.

BOSTON & MONTANA CONSOLIDATED COPPER AND SILVER MINING COMPANY.—The product of this company's mines in April amounted to 2,000,000 pounds of refined copper, 1,975,000 pounds in March and 1,975,000 pounds in February; total from July 1, 1890, 21,775,000 pounds, against 21,377,163 pounds in same period last year. Production of silver in March 26,793 ounces, against 23,279 ounces in February.

GLENGARRY MINING COMPANY.—This company is at present making an output of about $15,000 per month, and it is thought will be able to pay regular monthly dividends. The mine is well opened, the shaft being down 300 feet. The ore is treated at the Butte & Boston smelting works.

VOLUNTEER.—Work is progressing on the 600-foot level of this mine, west of the Gagnon. After the station was cut on this level, a crosscut tunnel was driven south to strike the lead, and a drift has been run west over 200 feet, without as yet very favorable results. On the 400-foot level, a drift was run 500 feet west from the shaft, and some stringers of very fine ruby silver ore were found, and a test shipment was made, the returns being so gratifying that the leading shareholders concluded to sink the shaft 200 feet deeper, expecting to find the ore body in a more compact and permanent form. The vein matter is a mixture of decomposed granite and pink manganese, through which some high grade ore has been found, but not yet in sufficient quantities to pay for saving. It will take two months' time to drive the west drift beneath the ore chute, which was encountered on the 400-foot level. A peculiar feature is an almost total absence of water, which leads to the belief that this is an extension of the Gagnon lead, which undoubtedly drains the Volunteer ground. It is rumored that an addition to the city of Butte will soon be platted on this ground, and the proceeds from the sale of lots will be employed in defraying the future expenses of the mine. At the present selling price of lots in the vicinity, the sum of $60,000 could probably be realized in this way.

NEVADA.

ELKO COUNTY.

(From our Special Correspondent.)

SAN FRANCISCO, April 30.

COMMONWEALTH MINING COMPANY.—The north drift, from the east crosscut, on the fourth level, has cut ore on the west side, assaying as high as $193 per ton.

NORTH BELLE ISLE MINING COMPANY.—The stopes from the north intermediate drift from No. 4 chute, 600-foot level, are yielding good ore, and the 500-foot level stopes are looking much better. Last week eight cars of first-class ore and 72 cars of second-class were hoisted.

NORTH COMMONWEALTH MINING COMPANY.—A branch drift from the north drift has been started on the second level to reach the Del Monte line. The work of extracting ore developed by the north drift will be commenced as soon as the connection by raise is made with the third level. The stopes last week produced 30 cars of first-class ore, of average assay value of $275 per ton and 78 carloads of second-class ore assaying $30 per ton.

EUREKA COUNTY.

(From our Special Correspondent.)

EUREKA CONSOLIDATED MINING COMPANY.—The company again commenced buying ore on the 27th inst., and so far it has had as much offered as needed with promises of more when the roads are well opened. The company is paying Salt Lake rates less freight charges, and the furnaces will start as soon as coal can be hauled.

HUMBOLDT COUNTY.

RABBIT HOLE.—Work has been resumed in the Rabbit Hole sulphur mines with a force of 12 men. The property is owned by Alexander Wise, of Winnemucca, Nev.

THIES-HUTCHINS.—It is reported that this antimony mine has been purchased by a New York syndicate which will at once erect a furnace on the property for the reduction of the ore.

LINCOLN COUNTY.

INDEPENDENCE MINING COMPANY.—This mine was sold in Dayton on February 16th, last, to James Landry, a co-owner, for $11,000. The purchase money was not paid, and as a consequence the property was resold, the last purchaser being F. S. Lacrouts and the consideration $6100. An attempt was made to make this sale void, but as the court held that the mine had been sold at a reasonable figure, the sale was confirmed. It is thought now the mine will be worked and that the Oest litigation will be amicably settled so that more active mining operations may be expected in Silver City in the near future.

PIOCHE MINING AND REDUCTION COMPANY.—A new strike is reported in the Onondaga mine. The drift in the 400-foot level of the Burke mine is also said to be looking very well, a 2½-foot vein of 40-ounce lead ore now showing in the face. Work on the new smelting works at Clafiin, as the new town is called, is progressing rapidly.

STOREY COUNTY—COMSTOCK LODE.

(From our Special Correspondent.)

The following is a statement of the output of Comstock mines during the past week:

Mines.	Tons.	Assay value.—April 25th.	Assay value.—April 18th.
Con. Cal. and Virginia.	1,560	$33.10	$33.80
Chollar	542	19.22	18.02
Gould and Curry	352	22.22	23.68
Ophir	*	22.75	...
Overman	598	†15.48	14.25
Savage	560	17.50	17.59

* Stored in the mine.
† Car samples.

ALTA SILVER MINING COMPANY.—This company resumed work on the 28th inst.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—A report is current that an important improvement has been made on the 1,500-foot level. The ore body which has been cut is said to be 7 feet wide, assaying from $300 to $400 per ton. This is supposed to be a continuation of the ore body on the levels above. According to the official report, the width and quality of the ore exposed 43 feet above the 1,500-level continue to hold good.

HALE & NORCROSS MINING COMPANY.—The winze started from the end of No. 3 east crosscut is down 50 feet, with the bottom still in ore. A small hoisting engine has been put in place at the top of the winze, and facilitates the work very much. The main incline has been repaired and retimbered to the 1,500 level, and the station on that level will soon be reopened.

JUSTICE MINING COMPANY.—The bottom of the south winze, 490-level, is down 53 feet, and is of fair-grade ore. The mill was to have started up last week, but in all probability the stamps will not be dropping before May 1st.

WHITE PINE COUNTY.

JOANNA.—It is said that a syndicate of Montana capitalists is negotiating for the purchase of this group of mines. They are at present bonded for 60 days for $150,000.

NEW MEXICO.

DONA ANA COUNTY.

(From our Special Correspondent.)

STEPHENSON-BENNETT.—A new strike has just been made in the lower tunnel of this property in the Organ Mountains. The vein is 8 feet wide, and recently, while working on what was thought to be the foot wall, the miners broke through into a mass of galena, the extent of which is as yet undetermined. Assays show the 8-foot vein to run 15½ ounces in silver and from 40% to 42% lead. It is especially valuable as a fluxing ore, and regular shipments of ore are now being made to the El Paso smelters.

GRANT COUNTY.

A large force of miners is again employed in the American mine at Hachita, and regular shipments of lead ore will be resumed immediately. This mine has been closed down for several weeks on account of a change in management of the El Paso Smelting Company, owned by the Consolidated Kansas Smelting and Refining Company, to which the mine belongs. Several other good lead mines, it is said, have been opened near Hachita, and in the other camps in the southern part of that county, within the past four or five months, but there is very little profit now in lead mining in New Mexico, and but little ore has been taken from the mines.

COLCHIS MINING COMPANY.—The mill, below Silver City, which has been constructing more than three years, is still incomplete, and all work on it has been suspended. According to report, stock of this company has been sold in New York and Boston to obtain money for building the mill. A large sum, however, is yet needed to complete the work, which was specially designed to treat low grade ores.

SOCORRO COUNTY.

(From our Special Correspondent.)

LAST CHANCE.—The mill is rapidly nearing completion. If finished according to the plans of Superintendent Kirkegard, it will be one of the best in the territory. Work on the mine is steadily progressing, with very satisfactory results. It is done by contract, and an abundance of ore will be ready for the mill when it is completed. The ore is of low grade, but the immense quantity so readily available makes the enterprise only a question of economical management.

NORTH CAROLINA.

GUILFORD COUNTY.

(From our Special Correspondent.)

NORTH CAROLINA STEEL AND IRON COMPANY.—Mr. Kase, who was recently elected general manager of this company, has arrived at Greensboro and taken charge of the company's operations. Surveys are being made for the side tracks which are to connect the furnaces with the main line of the Cape Fear & Yadkin Valley and Richmond & Danville railroads. The furnaces will be erected immediately.

MECKLENBURG COUNTY.

(From our Special Correspondent.)

CHINQUEPIN HILL.—Mr. A. V. G. Smith, of Troy, N. Y., who purchased this property about a year ago, and after doing several months development work suspended operations, has returned and will resume work at the mine. If the developments justify it a 10 stamp mill will be erected during the coming summer.

OHIO.

W. S. Scott, president of the Ohio Miners, and L. M. Beatty, who has been performing the duties of organizer, had a conference in Columbus, O., on the 5th inst., with the officers of the United Mine Workers, with the result that the strike for the eight-hour day in that state will be continued and a demand made for the reinstatement of discharged miners.

PENNSYLVANIA.

COAL.

The 5,000 miners of the Pittsburg district have reached an agreement with their employers by which last year's rate of 79 cents is affirmed. In the settlement the miners gained an advantage, it being that if there was an advance in the selling price of the coal of any mine or mines the diggers should receive a proportionate increase.

Monongahela River coal shipments have been suspended for the present on account of low water. The present season has been a most remarkable one in regard to the stage of water. Since the 1st of January there has been a rise almost every week, and at no time has there been an accumulation of over 2,000,000 bushels of coal in the harbor, although the mines have been running up to their full capacity since the end of the strike.

The Schuylkill Coal Exchange has issued a report dated Pottsville, April 30th, 1891, which shows that the collieries drawn to return prices of coal sold in month of April, 1891, to determine the rate of wages to be paid, make returns as follows: P. & R. C. & I. Co. (Shenandoah City Colliery), $2.22[8]; Boston Run Colliery, $2.28[3]; Eagle Hill Colliery, $2.23[1]; Suffolk Colliery, $2.24[7]; Draper Colliery (H. L. Williams), $2.24; total, $11.23[1]. The average of these rate is $2.24[6]. The rate of wages to be paid for work done during the last two weeks of April and the first two weeks of May, 1891, is 8% below $2.50 basis.

BUCK MOUNTAIN COAL COMPANY.—The Philadelphia & Reading Railroad Company has asked that this company be perpetually enjoined from crossing the East Mahanoy tunnel with its gangway, at the point determined by the survey on which it is being constructed, and that it be commanded to leave a pillar 150 feet thick on either side of said tunnel at the point at which it crosses. The gangway has been driven 1,810 feet and is progressing at the rate of three feet per day. The point designated for crossing the tunnel is 900 feet from its north end and 35 feet above the roof. It is claimed that it will cut into a ventilating shaft, and further that the coal vein as well as the overlying strata has been more or less loosened by the work of construction, and to such a degree that the walls will not stand the crossing of the gangway.

KINGTON COAL COMPANY.—Coal breakers Nos. 1 and 4 of this company, at Edwardsville, with several boiler and machine houses and sixty cars were destroyed by fire on the 4th inst. The loss will reach $250,000, partly insured.

GAS.

PHILADELPHIA NATURAL GAS COMPANY.—The annual meeting of this company was held at Pittsburg on the 6th inst. The report for the year ending March 7th, 1891, showed a net profit of $1,148,163. The assets are put down at $10,087,121. The individual profits March 31st, 1891, were $3,131,534.

NICKEL.

LANCASTER GAP.—The famous Lancaster Gap nickel mine, situated near Gap station, Lancaster county, is about to shut down; in fact only a few miners are now at work, these being engaged in prospecting for new bodies of ore, and from all appearances, with little probability of success. The ore has been gradually thinning out for many years.

OIL.

While drilling for gas, according to reports, a 100-barrel oil well has been struck at a depth of only 390 feet, one-fourth of a mile east of Leechburg, Armstrong county, on the property of Joseph P. Beale. There are no oil wells within several miles of the Beale well.

The production of the Wildwood oil field is rapidly declining. During the month of April the total runs from the field were, in round numbers, 243,830 barrels, or a daily average of 8,027 barrels. The indications are, it is now said, that within the present month the highest run for any one day will not equal last month's average. It appears that last Saturday Wildwood's production was 6,300 barrels, which is lighter than at any time in the past six months, with one exception, April 30th, when it dropped below 6,000 barrels.

SOUTH DAKOTA.

LAWRENCE COUNTY.

DEADWOOD AND DELAWARE SMELTING COMPANY.—The foundation for the main engine is now very nearly completed and putting the engine in place will commence as soon as the railroad track from the freight yard to the smelter has been laid. Large quantities of machinery are stored in various finished portions of the buildings, and it is expected that the plant will be ready to go into full operation by August 1st.

SONORA.—This mine, adjoining the Oro Fino, near Galena, has a valuable 18-foot ledge of ore in sight. Both walls are clearly defined and nearly vertical. The ledge carries zinc, pyrites and silver-lead to the value of about $80 per ton. The vein was struck by a crosscut on the 230 level from the Oro Fino workings, and the work is being done under the supervision of Superintendent F. R. Carpenter, of the Deadwood & Delaware Smelting Company. The property itself is owned by the Swift Bros., of the Miller syndicate.

TENNESSEE.

BEDFORD COUNTY.

ALABAMA COAL AND IRON COMPANY.—This company is erecting an ore washing plant at its Shelby Furnace mines at Shelby.

POLK COUNTY.

DUCKTOWN COPPER AND SULPHUR COMPANY.—The work of erecting the new smelter at Isabella is being pushed vigorously. The narrow gauge railway at that point is being put in order to convey the ore from the mine to the smelting works.

UTAH.

JUAB COUNTY.

New discoveries of rich ore are reported in the Dugway district, and the rush thither continues. It is said that there are now 1,000 men camped in the district. The Deep Creek stages are now running regularly between Stockton and Dugway, the time between the two points being 20 hours. Rich ore has been struck by Messrs. Barbee & Kimball, two miles east of the Buckhorn mine, and, it is said, on the same lode as the latter, which has been traced for that distance. A rich strike is also reported in the Cousin Jack claim.

BUCKHORN.—Regular shipments are now being made from this mine, the ore being hauled to Stockton by wagon. Developments in the property are showing a big ore body.

CAROLINE.—A strike of rich ore has been made in this property, which adjoins the Bullion, Beck and Champion, and is worked through the latter. The Caroline is owned by Mr. John Beck.

CENTENNIAL-EUREKA MINING COMPANY.—It is rumored in Salt Lake City that this company will in the future pay monthly dividends of $1 per share, instead of 50 cents as heretofore. The condition of the mine and the high grade of the ore that is now being shipped warrant the belief that the company can safely make this increase.

RED ROSE.—The vein of rich ore recently struck in this property is widening as it is drifted upon, and now shows a breast ten feet in width, six feet of which is of high grade. It is said that the mine could output as much as 20 tons per day with present developments only. It is not likely that any attempt will be made to produce much ore from the mine until it is opened for more economical operation. The ore was struck in a shaft sunk 350 feet from a tunnel. The bottom of the shaft can be tapped by a new tunnel of comparatively short length.

SALT LAKE COUNTY.

A large amount of exploration work is being done in Bingham Cañon this spring, and from indications the old camp will make a larger output during the present year than for a long time past. A large amount of ore is stored on the dumps of many of the mines, the results of the work during the winter.

FLAGSTAFF, LIMITED.—At the ordinary general meeting of the shareholders of this company which was held in London on the 23d ult., the report of the directors indicated a somewhat improved condition of affairs. The operations at the mine had been much retarded during the past year by the disastrous fire which entirely destroyed the engine house and damaged much of the surface machinery. It was decided to rebuild the engine house and air compressing machinery upon a more convenient site and good progress was made with the work; but before it was completed the winter set in, and has been so unusually severe, that all work was much delayed. A rich body of ore was struck in May, 1890, and has now been opened in several directions. There is at the present time stacked in the mine and in the ore bins about 1,400 tons of ore of estimated value of $60,000 to $75,000. The prospects of the mine were that its output would be much increased during the current year. The present Flagstaff Company was organized in June, 1889, being a reconstruction of the New Flagstaff Mining Company, Limited.

YORK.—This mine is now producing and shipping 20 tons of ore per day, and this output is to be doubled as soon as the condition of the roads improves so that heavier loads can be handled. It is said that the mine is so opened that 50 tons of ore could be shipped daily without drawing upon the reserves. Large bodies of galena ore of high grade in lead are being opened in several parts of the mine.

TOOELE COUNTY.

GENOA.—Rich ore has been struck in this mine located at Clifton, in the Deep Creek country. The ore body was uncovered within a few feet of the surface. Samples have assayed from 20 to 1,000 ounces silver, and 18% to 30% copper.

WASHINGTON.

OKANOGAN COUNTY.

LONE STAR.—This property, we are informed, has been bonded by a syndicate composed of English capitalists. The mine is mainly owned by Allan C. Mason, of Tacoma; is located on the west bank of the Conconully Creek, about one mile north of Couconully and about six miles north of Ruby City. It has always been considered a very valuable mining property. It has been developed to a great extent, but no ore has ever been shipped from it except for mill-test purposes. The main incline is down over 350 feet and from it various levels aggregating 760 feet have been run. On the main dump there are about 1,200 tons of ore, while perhaps 200 more have been stored at the mouth of a smaller shaft.

WEST VIRGINIA.

GAS.

WHEELING NATURAL GAS COMPANY.—The annual meeting of this company was held on the 4th inst. The reports submitted showed that the company was entirely free of debts, with a surplus in the treasury of $40,744.38. During the year the receipts from all sources amounted to $182,822.23, and the disbursements, including everything, $177,119.15. There was $186,974.53 charged over to profit and loss for the cost of abandoned wells and depreciation in leases, tools, etc. The net earnings were $110,831.71. The company owns 145 miles of pipe line, has 21,068 acres of oil and gas territory under lease and 20 producing gas wells and one oil well. The election of officers and directors resulted as follows: President, Wm. Flinn; vice-president, J. M. Guffey; secretary and treasurer, Wm. J. Diehl; directors, Wm. Flinn, J. M. Guffey, R. C. Elliot, Henry Fisher, A. F. Keating, Joseph W. Craig, Edwin Bindley, Jeremiah Miller, John N. Neeb, C. L. Magee and T. H. Given.

FOREIGN MINING NEWS.

MEXICO.

NUEVO LEON.

(From our Special Correspondent.)

MONTEREY, Mexico, April 24, 1891.

The output of local silver lead mines has been increasing steadily since the first of the year. The Nuevo Leon smelter is running smoothly with four furnaces, the remaining two will be blown in within a short time. The official inauguration of this plant was a grand affair, and wound up with a banquet and ball. The Governor and his staff and several military bands were features of the occasion.

Since the location of smelters here, this city has stepped to the front as the leading ore market of the Republic. It is to Mexico what Denver is to the western mining states and territories. In the press of this country Monterey is now called the "American Metropolis of Mexico."

The Monterey & Mexican Gulf railroad extension to the Sierra Mojada mines is no longer a matter of doubt; construction will be resumed westward from General Trevino, its junction point with the Mexican International railroad, within a short time. The extension of this road will give an outlet to the San Pablo and San Mareas districts as well as to the Sierra Mojada. In each of these districts there is renewed activity in locating and opening up new mines and by increasing the ore reserves in the older ones.

The present output of the Sierra Mojada mines is 450 tons per day, which can be increased to 1,000 tons per day when adequate transportation facilities are afforded.

The Todas Santas mine, located in the San Nicolas district, is turning out some very fine, high-grade silver ore.

The Vegonia, La Britania and Mina Negra are very promising mines in the San Jose district. An effort is being made by the mine owners of the San Nicolas and San Jose districts to have the Monterey and Mexicau Gulf road build a branch line from the main line at Linares station, a distance of about forty miles, to their mines. They also agree to put $150.000 in a smelting plant to be located at Linares, provided competent smelting men with means can be found to join them in the enterprise. Linares possesses many advantages as a central smelting point.

The Guadalupe and Cerralve districts are producing large quantities of very desirable ores.

It is expected that the Monterey Smelting Company will blow in its smelter early in May. It is strictly first-class in every particular.

The construction of the Great National Smelter (Monterey's third smelting plant) is being pushed vigorously and the contractors are under bond to have it completed by September 1st. The combined capacity of these three smelters will be more than 1,000 tons per day, which will tax the capacities of our railroads to keep them running. There is no fear whatever as to the ore supply.

NEWFOUNDLAND.

(From an Occasional Correspondent.)

PYRITES COMPANY, LIMITED.—The mines acquired by this recently organized company are situated on the southeastern part of Pilley's Island, Notre Dame Bay, Newfoundland, 20 miles from Little Bay, and about 240 miles northwest of St. Johns, Newfoundland. Steamers from New York call at the island fortnightly during the open season. In close proximity to the mines is a fine harbor, capable of holding a large fleet of vessels, channels to which are all buoyed from 7½ to 15 fathoms of water. The shipping season extends from about the beginning of May to the end of December. There is erected at the harbor, and within 300 yards from the shafts -by which the mines are now being worked—a substantially built wharf connected with the mines by a well-equipped tramway) at which steamers of any capacity can be loaded. An addition is now being made to the wharf, and when this is completed, it is claimed that 1,000 tons of ore can be put on board steamers in 24 hours. The lode which is being worked is a strong one, running east and west, and dipping south at an angle of 45 degrees. It is composed of a solid mass of pyrites, varying in width from 50 feet at surface to 94 feet at the No. 1 level, and at the No. 2 level to a discovered width of 123 feet. No. 3 level, at a depth along the foot wall of 248 feet, is not as yet greatly extended. The workings along the vein are about 500 feet in length, and the mining work which has been done on the property has laid open a very large extent of ore ready for extraction, which is estimated at about 500,000 tons. The ore is said to contain about 52% sulphur, and 46·80% of iron. The present company, which has been organized with a capital of £300,000 ($1,500,000) having its head office in London, is represented in New York by Messrs. Pim, Forwood & Co. It is proposed to put large air compressors and drills into these mines, along with other extensive improvements, which will greatly facilitate the handling of the ore and increase the output.

MEETINGS.

Brownlow Mining Company, at the office of the company, Room 44, Jacobson Building, Denver, Colo., June 8th, at 10 A. M.

Haile Gold Mining Company, at the office of the company, Nos. 40 & 42 Wall street, New York City, May 12, at 12 o'clock noon.

Scorpion Mining Company, at the office of the company, Room 28, No. 310 Pine street, San Francisco, Cal., May 11th, at 12.30 P. M.

DIVIDENDS.

Calumet & Hecla Mining Company, dividend of $5 per share, $500,000, payable June, 16th, at the office of the company in Boston, Mass. Transfer books close May 21st.

May-Mazeppa Consolidated Mining and Milling Company, dividend No. 12, of 1¼%, $12,500, payable May 15th, at the office of the company, Room 7, Patterson and Thomas Block, Denver, Colo.

Silver Mining Company of Lake Valley, dividend No. 12, of 5%, $25,000, payable May 14th, at the office of the company, No. 119 South Fourth street, Philadelphia, Pa.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Amn't per share.
Andes, Nev.	37	Apr. 4	May 8	May 28	.30
Big Hole Placer, Ut.	....	Mar. 10	Apl. 22	May 12	.01
Chollar, Nev	29	Apr. 5	May 12	June 2	.50
Centennial Gravel, Cal	41	Mar. 28	Apr. 27	May 27	.03
East Sierra Nevada, Nev.	2	Apr. 14	May 22	June15	.05
Hale&Norcross, Nev	99	Mar. 17	Apr. 22	May 14	.50
Kentuck, Nev.	1	Mar. 31	May 5	May 26	.20
Scorpion, Nev	2	Apr. 14	May 22	June15	.10
Scorpion Silver, Nev	26	Apr. 14	May 22	June15	.15
Silver Hill, Nev.	28	Apr. 23	May 28	June18	.20
Teresa, Mex.	3	Mar. 28	May 1	May 19	.10
Yellow Jacket, Nev.	48	Apr. 14	May 16	June.0	.50

MINING STOCKS.

For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, St. Louis, Pittsburg, Birmingham, Ala.; London and Paris, see pages 575 and 576.

NEW YORK, Friday Evening, May 8.

A much better feeling than has been felt for some time has been prevalent in the mining stock market for the past week. This feeling doubtless originated over the higher San Francisco quotations. It is a well-known fact that most of the Comstocks are now held in the West, and it is claimed on good authority that the present buying is to fill New York orders. History repeats itself, and it will not be surprising if those who parted with stocks some time ago at low figures are now loading up at top-notch quotations.

The San Francisco market has been forcing New York quotations, and, when the news reached here last Saturday that there had been a slump there, it was but natural for speculators to pull in their horns. As a consequence there was but very little doing to day in this class of stocks.

One very encouraging feature of the market was the trading in many neglected stocks, indicating a general revival of activity. Values were all well maintained. The sales of the week were about equally distributed, and brought out more California and Colorado stocks than in some months past. The sales for the week aggregated 105,161 shares, of which number 17,408 were dividend paying.

The Comstocks were more active during the week under review than they have been since the boomlet of last February. With active trading, with hardly an exception, values advanced. Alpha on two sales rose from $1.25 to $1.35, closing at that figure to-day. Alta sold steadily at $1.20. Andes to-day was quoted at $2.60 for 200 shares. Comstock Tunnel was remarkably active throughout the week, closing at 20c. last Friday. It opened on Saturday at 19c., ranged between 19c. and 21c. till Wednesday, when it went up to 23c., and on Thursday reached 24c. It was not quoted to-day. Sales amounted to 35,453 shares. One thousand dollar bonds sold on Tuesday at 36% as against 36¼%, the quotation of last week. Consolidated Imperial, closing at 28c. last week, entered the market on Tuesday at 30c., rising to 33c. on Thursday. Two blocks, aggregating 1,600 shares, were sold. Exchequer received one sale of 200 shares at $1.10, the quotation of last week. Julia was inactive, but it rose from 31c. to 37c. as against the last week's closing of 36c. Justice sold 100 shares to-day at $1.10. Scorpion, from closing at 50c. on April 18th, sold yesterday at 35c. for 300 shares Union Consolidated closed last week at $4 bid, and opened on Saturday with a sale at $3.40, rising later to $4.20. It did not again appear in the market.

Bullion opened at $2.60 in the middle of the week and closes on very light sales at $3.00. Belcher, from the closing at $3.20, opened on Tuesday at $3.40. The succeeding day it declined to, and closed at $3.15. Consolidated California and Virginia has been a star of the first magnitude. From closing last Friday at $15.50, it opened at $17 on Saturday; and then rapidly climbed the scale until $19 was reached yesterday. The reported strike of a new body of very rich ore on the 1,500 foot level, doubtless had its influence in this movement. According to latest advices, however, no bonanza has been struck. The rise in values must be attributed to manipulation by the San Francisco Stock Exchange magnates. The stock has not been quoted here to day, but sold on the San Francisco board for $17%. Crown Point opened on Tuesday at $2.90, at which figure it closed April 18th. It then rose steadily to $3.10, the highest quotation of to-day. Gould & Curry from closing at $3.40 sold on Saturday at $3.50 for 100 shares. It has not appeared on the Exchange since. Navajo led quite an active career during the early part of the week. Closing last week at 35c, first sale was made on Tuesday, at 42c. reacting it held steady for the balance of the week at 40c. Ophir, from the closing of $7.88 sold Wednesday at $9.25, to the extent of 100 shares. The last sale of Sierra Nevada was on April 16th at $3.60, Tuesday 100 shares were sold at $4.35. Yellow Jacket, from the closing of $3, opened the week at $3.15, sold at $2.50 the day following, and closed yesterday at $3.30. Savage, from the closing of $3.40, opened Saturday at $3.50, and on a second call Tuesday sold at $4.15.

Of the Colorado stocks: Lacrosse quoted last on April 1st at 5c. sold 100 shares at 6c. on Thursday. Monitor sold Saturday at 4c. Chrysolite from the closing of 25c. sold 200 shares on Monday at 30c. Colorado Central, which was last quoted March 13th at $1.35, sold 100 shares on Monday at $1.50. Freeland was one of the active stocks of the week. From the closing of 15c. it opened at 17c. ranging between those two figures; 6,700 shares changed hands. Holyoke, which led an active career last week sold 100 shares at 3c. Leadville Consolidated changed hands to-day at 11c., for a 100 share lot, as against 12c. last week. Little Chief from closing at 32c. April 24th opened at 26c. reacted to and closed at 24c. yesterday. Robinson Consolidated was in great demand. From closing last week at 53c. it was bid up to 60c. and this only brought out 700 shares.

In California stocks we note an active career in Astoria; 7,000 shares changing hands in small sales at 2c. Belmont repeated its history of previous weeks, namely making a gain of a few cents. From the closing at 48c., and after an active week involving sales of 3,700 shares it closed at 51c. to-day. Brunswick Consolidated was quite active during the week. The general quotation being 10c; 3,500 shares changed hands. Middle Bar became active after Tuesday and at lower figures than those prevailing for some time; 16,500 shares were sold in small lots at 2c. North Standard sold 100 shares on Wednesday at 8c. Syndicate from the closing of 10c., sold 2,000 shares on Tuesday at 14c. Plymouth maintained its usual quotation of $2 on light sales.

Belle Isle, of Nevada, which had not been quoted before this year sold on Tuesday at 75c. for 100 shares. Silver Hill, another Nevada, disposed of 200 shares to-day at 35c. Barcelona, which has not been traded in this year, was introduced to the board and given an active career. It opened at 20c. and after many up and downs, it landed at 11c. to-day. Sales involved 1,400 shares.

The copper stocks were not in the market.

Father de Smet, from a quotation of 45c., the highest reached last week, opened at 49c., sold off to 47c., and closed Wednesday at 40c.; 1,000 shares were brought out. Iron Hill, quoted March 4th at 39c., sold 100 shares on Wednesday at 35c.

Augusta Mining and Investment Company, whose listing was noted in our last week's issue, was quite actively inquired for. From the closing of $15.35 it opened at $15.38, making a steady gain and reaching $16, the closing point; 400 shares changed hands. One sale of the bonds involving $10,000, sold at 90.25%.

Castle Creek, of Idaho, sold 400 shares during the week at 2c.

El Cristo was much stronger than it has been for some time. From the closing of 37c., it opened at 40c., rapidly climbing until the quotation of 60c. on Tuesday. The next quotation declined and closed at 60c.

Mutual Smelting and Mining, after a moderately active career at $1.40 and $1.45, weakened to-day, and closed at $1.35.

Phœnix, of Arizona, which has been quite active for two weeks past, was very quiet at 40 and 45c.

Moulton, of Montana, quoted last February 4th at 39 and 40c., sold 200 shares on Saturday at 39c.

Denver.

Prices and sales for the week ending May 2d, 1891:

Company. Mines.	Opening.	H.	L.	Closing.	Sales
Alleghany	20a	12½	11	...	200
Amity	14½b	*05	04	03¾	4,700
Bangkok-C.-B.	09b	*09½	08½	08½	5,500
Bates Hunter	69b	70	70	70	500
Brownlow	05¾b	06¼	05½	05¾	2,300
Calliope	17¾b	....	....	16¾	.....
Cash	....	....	....	11	....
Clay County	109b	110	110	†117	900
Gettysburg	....	21	20	21	34,900
Leavenworth	18b	18¼	18	17¾	500
Little Rule	108b	109	108	108	500
Matchless	280b	....	....	285	....
May-Mazeppa	122a	120	119	120	2,000
Oro	....	....	....	....	.....
Pay Rock	02¾b	03¼	02½	03¼	31,000
Puzzler	06½b	06¾	06¼	06¼	8,500
Reed National	55b	....	....	56	.....
Rialto	75b	†100	70	†100	5,800
Running Lode	25¼b	25½	25	25	200
Whale	....	20	20	...	200
Bal. Smuggler	100a	....	....	....	.....
Prospects.					
Argonaut	15b	....	....	15	.....
Big Indian	10a	*09	08½	*08	500
Big Six	14½	15	14¼	14¼	6,400
Century	20b	27	24	26	2,600
Claudia J	06½b	*07	06½	*07	2,000
Nat. G. & Oil Co	12½b	19	13	18	9,630
Diamond B	*07	07	06¼	06¾	27,600
Emmons	*47½	*47½	45	45	7,300
Golden Treas	33b	*36	31	32½	3,600
Ironclad	04b	04	03¼	(3¾	36,600
John Jay	*07½	07½	06¾	(6½b	5,500
Justice	13¾b	13	13	13	200
Legal Tender	*06	*06	04	04	5,900
Morning Glim	45b	45	43	44	1,800
Park Consolidated	18½b	21½	19	21½	400
Potosi	08	08	07	07¼	5,000
Total					212,600

* Buyer 30. † Buyer 60. a Asked. b Bid.

Boston.

May 7.

(From our Special Correspondent.)

There has been very little doing the past week in copper stocks, but prices have ruled fairly steady in view of the extreme dullness of the market. There is evidently no speculation in them at present, and about all that can be said is that it is a waiting market.

Boston & Montana sold up to $42 at one time during the week, but finally closed at $41¼.

Butte & Boston showed a little more activity, and advanced to $16½, losing the advance later, and closing at $15¾, the same as last week.

Calumet & Hecla declined from $265 to $257 on very small sales. Franklin was quite steady at $17¼@$17½.

Osceola was a little heavy, and declined from $36½ to $35¾.

Quincy fell off from $108½ to $105 on small sales.

Tamarack was quite firm, all the sales being at $150.

Centennial sold at $15½@$15¼.

Kearsarge was dull at $13@$13½.

Santa Fé declined from 65c. to 55c., and a small lot sold at 50c.

National sold at $3, the same as last week.

Arnold sold at 75c., and small lots of Allouez at $3½.

The balance of the list was entirely neglected.

Silver stocks were dull, with sales of Dunkin at 65c. and Catalpa at 25c.

3 P. M.—Calumet & Hecla declined to $255 this afternoon, and Franklin advanced to $18. Atlantic sold at $15½.

By Telegraph.—Calumet & Hecla, $225 asked; Montana, $41½; Osceola, $35¾; Butte & Boston, $15¾; Franklin, $18.

San Francisco.

April 30.

(From our Special Correspondent.)

The market has been so quiet during the week and the offerings so light, that had a change not taken place this morning, the week's trading might be summarily dismissed. After the regular session to-day, however, Consolidated California & Virginia advanced from $13.87½, the opening figure, to $15.87½, with heavy sales, and the market at once responded by prices strengthening along the line of Comstocks. Many of the orders to buy came from Virginia City, and to some extent are confirmative of the report of an improvement in the bonanza mine.

Best & Belcher has been selling fairly steady, the fluctuations being comparatively slight. Last week the average price was $7, and the ruling figure to-day is $8, with considerable trading.

Ophir has been also in fair demand at $7.75, and sold freely to-day at $8.25.

The south end stocks have been very quiet and sales light.

The starting up of the Union Mill, at Tuscarora, and the ore developments in one or two mines in that district, have served to create a demand for these stocks. Commonwealth has sold steady at $1.10@$1.15, North Belle Isle at $1.05, and North Commonwealth at $1.10. The advance this week in each of the above has been from 15 to 30 cents per share.

In the Quijotoa group Peer has ruled much weaker, selling for 20 cents, Crocker being steady at the same price.

Generally speaking, the tone of the market is heavy, and present values appear to be maintained with effort; but from the condition of affairs on the Lode it is possible for a strong, active market to develop at any time most convenient to the manipulators.

By Telegraph.—The quotations at 10 A. M. Friday, the 8th inst., were as follows: Alta, $1.15; Best & Belcher, $8; Belle Isle, 60c.; Bodie, $1.25; Bulwer, 35c.; California & Virginia, $17.75; Challar, $3.75; Crown Point, $2.85; Eureka Consolidated, $4; Gould & Curry, $3.70; Hale & Norcross, $3.70; Mexican, $4.85; Mono, 60c.; Mt. Diablo, $2.15; Navajo, 35c.; North Belle Isle, 80c.; Nevada Queen, 45c.; Ophir, $6.25; Potosi, $4.55; Savage, $3.70; Sierra Nevada, $3.80; Union Consolidated, $4.60; Utah, $1.35; Yellow Jacket, $3.05.

Salt Lake City.

PRICES AND SALES FOR THE WEEK ENDING MAY 2, 1891.

Name and Location of Company.	Opening.	Highest.	Lowest.	Closing.	Sales.
Alice, Mont	1.65	1.75	1.50	1.60	300
Alliance, Utah	2 00	2.00	2.00	2.00	....
Anchor, Utah	6.50	6.55	6.50	6.55	....
Apex, Utah	.10	.12	.10	.11	19.000
Barnes Sulphur, Utah	.02	.02	.01	.01	6.200
Big Hole Placer, Mont.	.06	.08	.05	.07	3,500
Centen'l Eureka, Utah	....	....	....	....	....
Congo, Utah	.19	.19	.15	.15	4,500
Crescent, Utah	.32	33	.32	.32	1,400
Daly, Utah	18.75	18.75	18.50	18.55	....
Glencoe, Utah	....	....	....	....	....
Horn Silver, Utah	3.30	3.40	3.25	3.40	800
Malad Con., Idaho	.02	.02¾	.02	.02½	26,500
Mammoth, Utah	3 60	3.60	3.00	3.40	...
Northern Spy, Utah	2.75	2 75	2.00	2.00	....
Ontario, Utah	..	....	....	....	....
Stanley, Utah	.17	.18	.10	.16	9,500
Utah L. & C. Co.	....	....	....	....	....
Utah Oil Co., Utah	....	....	....	....	....
Woodside, Utah	....	....	....	....	....
Total shares sold					71,760

St. Louis.

May 6.

(From our Special Correspondent.)

During the past week the amount of business transacted was smaller than usual. Total sales since the first of the month mount up to only about 10,000 shares. This inactivity is to be accounted for by the fact that many of the brokers are interested in wheat, and have had about as much as they can do to attend to their interests in that quarter.

Elizabeth began the month well by a sale of 1,400 shares at $2.35@$2.40 On Friday 350 shares of the stock sold at $2.37½@$2.40, and on the following day 300 shares were bid in at $2.40; Monday, $2.37½ was paid for 1,100 shares. Yesterday 200 shares sold at $2.40, and the market closes firm at $2.35.

Little Albert opened at 11c. with a sale of 100 shares; and during the rest of the week 800 more shares sold at the same price, the market closing at 11c.

Montrose had a couple of sales at 62½@63¾c. Two hundred shares were sold, the stock being bid at the close at 60c.

Small Hopes had but one sale of 100 shares at 87½c. Soon after the sale the stock fell to 80c., at which figure it closes.

American and Nettie opened at 20c. On Friday 100 shares sold at 25c., and 400 shares more on Saturday at 23¾c. On Monday 100 shares more went

at the same figure, when the price fell to the present quotation, 22½c.

Mickey Breen had several sales at falling prices. The opening sale was at $1.10, then at $1.07½, then $1, and to-day at $1.02. Sales amounted to 400 shares.

Yuma advanced considerably. The opening bid was 75c. and to-day the stock closes at 81¼c. Sales were made as high as 83¾c. Total sales amounted to 1,500 shares, of which 1,200 went at 80c.

Of Central Silver 2,000 shares were sold at 2c.@ 3½c. The market closes at 2c.

Granite Mountain opened at $25.50 and closes at $26.25. One sale of 25 shares at $26.25 was made.

Bi-metallic opened at $83 and closes at the same figure. There were no sales and very little inquiry for the stock.

PIPE LINE CERTIFICATES.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
May 2.....	70¾	72⅜	70¾	71⅛	23,000
4.....	71	72⅜	71	72	24,000
5.....	71¾	71¾	71	71	8,000
6.....	71	71⅜	71	71⅜	10,000
7.....	71¼	71½	71¼	71½	9,000
8.....	71⅜	72¼	71⅜	72¼	17,000
Total sales in barrels.....					91,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
May 2.....	70	72	70	71	24,000
4.....	70⅛	71	70⅛	70⅝	14,000
5.....	71½	71½	71½	71½	4,000
6.....	.....	.....	.....	.....	.....
7.....	71¼	71¼	71¼	71¼	2,000
8.....	71⅜	71⅜	71⅜	71⅜	3,000
Total sales in barrels.....					43,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 8.

STATEMENT of shipments of anthracite coal (approximated) for the week ending May 2d, 1891, compared with corresponding period last year.

Regions.	May 2, 1891.	May 3, 1890.	Difference.
Wyoming Region. Tons	404,438	304,539 Inc.	99,899
Lehigh Region "	146,904	105,727 Inc.	41,177
Schuylkill Region "	231,759	195,130 Inc.	36 629
Total..... Tons	783,101	605,396 Inc.	177,705
Total for year to date Tons	11,079,914	9,154,142 Inc.	1,925,772

PRODUCTION OF BITUMINOUS COAL for week ending May 2d, and year from January 1st:

EASTERN AND NORTHERN SHIPMENTS.

	1891. Week.	1891. Year.	1890. Year.
Phila. & Erie R.R.....	19*	41,887	42,081
Cumberland, Md.....	82,308	1,305,823	1,276,711
Barclay, Pa	*3,596	58,993	48,286
Broad Top, Pa.....	10,105	196,481	188,539
Clearfield, Pa.....	82,829	1,197,557	1,578 848
Allegheny, Pa.....	28,919	484,097	476,934
Beach Creek, Pa.....	40,171	773,745	659,891
Pocahontas Flat Top.....	55,261	816 510	634,598
Kanawha, W. Va.	46,171	766,006	725,014
Total.....	349,852	5,993,99	5,436,935

* Estimated
Week ending April 18th.

WESTERN SHIPMENTS.

Pittsburg, Pa	23,914	314,331	324,161
Westmoreland, Pa.....	27,925	675,219	616,388
Monongahela, Pa.....	12,833	194,817	92,679
Total	64,422	1,184,367	1,033,528
Grand total....	414,274	7,174,933	6,464,433

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending May 2d, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 50,061 tons; year, 971,567 tons; corresponding date in 1890—1,900,759.

Anthracite.

The outputs for the week ending May 2d show an increase of 139,880 tons in production over the previous week. The tonnage was 783,101 tons, an increase of 177,705 tons over the corresponding period in 1890.

The sales agents held a special meeting on the 7th inst. for the purpose of considering the general conditions of the trade, and more particularly to ascertain if the returns so far made as well as the spirit manifest by the producers gave promise that the month's output would fall within the limit fixed, or 2,500,000 tons. It is reported that the utmost good feeling prevailed. After canvassing the situation for two hours, it was concluded that the fixed tonnage would be adhered to fairly well. In case it be surpassed such excess would not be great. The conclusions reached were that the trade is in a very satisfactory condition, much more so than it was at the corresponding period in 1890, and that there was manifest an earnest desire on the part of producers to keep it so by enforcing restriction. The fact was developed that at the present time there is no stock accumulating at tide water. The question of prices did not come up for consideration. A meeting will be held on the 15th inst. for a second retrospective and prospective survey of the situation.

In the face of the fact brought out at this meeting, namely, that there is no accumulation of stocks at tide water, the following comparative figures will prove of interest, inasmuch as they portray a remarkably healthy condition of affairs: On March 31st, 1890, there were 992,309 tons of coal at tide water. On March 31st, 1891, the tonnage at tide water was 784,587 tons, showing a decrease in the year of 207,722 tons. When we consider that for the three months ending March 31st, 1891, the production was 1,787,130 tons in excess of that of the corresponding period in 1891, the only logical conclusion which can be reached is that this increase plus the decrease on tonnage at tide water making 1,994,852 tons, had, up to March 31st, 1891, gone into consumption. The official figures for the stocks at tide water at the end of April are not at hand, but it is stated upon fairly close estimates that there was no increase over the figures for the tonnage March 31st. An increase in consumption of nearly 2,000,000 tons, comparatively small stocks in hands of retailers and consumers, a not exceptionally large stock at tide water, better prices than those which prevailed a year ago, and a co-operation and good feeling among operators in keeping up prices and down production, all speak well for the year's business.

Lehigh coals are scarce and in large demand. Steam sizes of free burning coals are in good quest. The trade seems to be settling down to a fair business at full circular prices. We heard of two instances this week where heavy buyers who were offered coal three weeks ago at circular prices, minus 15% commission, came into the market by paying full circular prices for large invoices. The fact is suggestive.

The Coxe Bro. & Co. case has again been turned over to the Interstate Commerce Commission and in the manner set forth in our last issue. If that body requires as long a time to act as it did to render the decision, the same will be covered with barnacles before it is enforced.

Bituminous.

The soft coal trade is in a very healthy condition. The market of to-day is growing into one of general activity, and from causes which promise a good future trade. The failure of the eight-hour labor movement to assert itself in the regions shipping to tide water caused a slight reaction in the demand, and left the trade with some excess of stock which accumulated during April. But inasmuch as the trade at the present consists in closing contracts and making deliveries under the same, the effect of this excess is but slightly perceptible.

The contract season is about over, and most of the companies selling the better grade of coals report that they have secured—and in some cases surpassed—their usual tonnage; some claim to have sold up to their limit. Producers of the poorer grades, who have not recently been enjoying a particularly good business, report more activity. Prices for all grades are being well maintained. We quote f. o. b. Amboys $3.05@$3.10 and $3.15@$3.20. Freight rates are about the same as those quoted in last week's report.

NOTES OF THE WEEK.

The drawing for wages in the Schuylkill region, Pennsylvania, gave the average price of coal at five collieries at $2.246 for April, as against $2.22 in March, and $2.167 in April, 1890.

It is reported that quite a number of the members of the wholesale trade will participate in the excursion of the retail exchange noted elsewhere in this issue. All have a cordial invitation.

Messrs. Dickson & Eddy, general sales agents of the New York, Ontario & Western Railway Company's Lackawanna Valley coal, have moved their offices from No. 1 Broadway to 29 Broadway.

The Mount Carmel and Natalie Railroad Company, recently chartered to build a line to the anthracite coal fields north of Mount Carmel, began work on the 1st inst. The road will open up a comparatively new field, and will be a feeder for the Philadelphia & Reading.

Mr. L. R. Barrett, of the Lehigh Valley Coal Company, in company with his wife, left Thursday on the steamer Normannia for a two-months' tour of England and the Continent. During his absence Mr. Wm. H. Sayre, general agent of the company, will superintend the affairs of the New York office.

Mr. John H. Jones, of Philadelphia, Pa., who has had charge of coal statistics for the eleventh census, has taken the management of the Eastern business of J. B. Sanborn & Co., publishers of the coal dealer's Blue Book. Mr. Jones brings to the office a comprehensive knowledge of the coal trade as well as marked executive ability.

The retail coal exchanges of New York and Brooklyn will take their fourth annual excursion on May 26th–28th, inclusive. It will be over the Baltimore & Ohio Railroad, and will embrace visits to Baltimore, the battlefield of Gettysburg, Hagerstown, Harpers Ferry, Washington and Mt. Vernon. An elaborate programme of entertainment has been arranged. The incidental expenses of the trip will be included in the price of the ticket, or $20.

Mr. Percy B. Heilner, for many years associated with Robinson, Haydon & Co., has been appointed by the Philadelphia and Reading Coal and Iron Company as its sales agent for New York and vicinity, vice Mr. Frank M. Kelley, whose resignation as Eastern sales agent was noted in our issue of February 28th. The position made vacant with Robinson, Haydon & Co. by the resignation of Mr. Percy B. Heilner has been filled by the appointment of Mr. T. J. Adams.

The action of the United Mine Workers in deciding to concentrate their resources for the relief of the Connellsville strikers has the tendency to prolong the struggle in that district. To offset this the companies interested have commenced the importation of labor. The evictions continue, and have been productive of several bloody riots during the week. The companies claim that their position is strengthening daily, that they have 4,000 men at work, and have no difficulty in filling orders. The labor leaders claim that there are not more than 2,000 men at work. The strikers consider they have gained a point in the agreement of Cochran's and Laughlin's works to pay the old scale rates.

Boston.

May 7.

(From our Special Correspondent.)

The anthracite market continues to move in a steady manner. The tone is very firm, and promises to hold so for some time. The curtailed production is having a salutary effect upon the market, and to this fact alone is due the present strong feeling. Many of the large buyers refuse to purchase at ruling figures, and are patiently waiting a break in prices. They are slow to believe that the curtailment is really being lived up to, and look for a considerable increase in the production of this month. Agents are somewhat surprised at this attitude, which they hardly comprehend, and say that as soon as the limited supply is really known matters will have a different phase. The supply of broken has not improved, and several present orders have gone begging, as none of the leading agents is willing to accept them. The business here is favorable to an advance, and many transactions are being conducted with this in view.

Bituminous coal is inclined to be dull. Agents are in the market with plenty of coal and are evidently anxious to sell at the market figure. Prices are holding very well, and while dealers are quick to close a sale, they are not offering any special inducement to buyers in the shape of shaded prices. There is very little spot demand. Buyers do not look for a strike, but, on the contrary, expect lower prices.

The freight situation continues unchanged. Very little coal is being moved, and, consequently, there is but little inquiry for the fleet offering. From New York 55@65c. is quoted; from Philadelphia, 55@90c., and from Baltimore, $1@$1.10.

The demand of retail customers continues small. Prices are steady, and at present may be said to be firm. Most of the dealers have disposed of their surplus stocks, and now are not willing to sell at any figure below the market price. At a recent meeting of the Coal Exchange it was decided to extend its lease of life for at least another year, and its existence is expected to help steady the retail market, should this ever be required during the coming year.

The receipts of coal at this port for the week ending May 2 were 44,740 tons of anthracite and 20,835 tons of bituminous, against 43,633 tons of anthracite and 12,336 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 486,123 tons of anthracite and 455,802 tons of bituminous, against 383,645 tons of anthracite and 315,963 tons of bituminous for the same time last year.

Buffalo.

May 7th.

(From our Special Correspondent.)

The Water Department of this city was very much surprised when the bids for coal were opened and the lowest price named for grate was $3.70, as compared with $3.48 paid a year since. The result was a consultation with the Mayor and the managers of the Natural Gas Fuel Company. The latter made a proposition that they would supply gas for fuel purposes on a basis of $3.48 for coal, and if the fuel should by any accident give out they would furnish coal at same figure.

The water-works people say that they will not pay the aggregate increase of cost of coal of $7,000 to $8,000 per year; so they will doubtless take the gas-fuel, especially as by so doing they will save 20%, the cost of wages for handling the coal during the year. The superintendent says "The method of determining the cost of the fuel gas, which is to be furnished on the same basis as coal at $3.48 per ton, will be by the quantity of water pumped."

Four members of the United States Committee on Trade Relations with Canada arrived in Buffalo May 4th, and the next day held a public hearing at the Merchants' Exchange. Among other matters presented to them, Mr. Thomas Loomis stated that he had been in the coal business for 20 years; the sources of supply were Pennsylvania, and the market for Buffalo dealers Western New York, Canada and New England. He said "the Grand Trunk Railway of Canada advertised annually for about 750,000 tons of bituminous coal, which goes as far East as Montreal in competition with Nova Scotia coal, with a duty of 60c. net on the American product, and he, therefore, thought that if the duty on both sides of the line should be taken off, the result would be greater consumption in Canada of American coal." Mr. Eric L. Hedstrom, another coal dealer, testified "that Nova Scotia produced

1,800,000 tons of soft coal per year, New England getting about 40,000 tons of it, and that his impression was that the West and Canada took about 180,000 tons. He handled about 300,000 tons of anthracite coal in 1889-90, an insignificant amount of which went to Canada for the reason that the duty hindered trade and enhanced the price to consumer."

Chicago.

May 9.

(From our Special Correspondent.)

Business in anthracite coal is confined entirely to orders for current requirements, but even this is somewhat larger than usual, on account of the depleted condition of stocks. The feeling in the trade generally is that in consequence of the firm attitude manifested in the east, business will be much more regular through the coming season, and circular rates more easily secured. Some of the local and Indiana miners of soft coals will go out this week, pending negotiations now under consideration for an increase in price of coal mined. Mine owners have refused to confer with the representatives of the men, and a long strike may ensue. The eight-hour day question was waived for the present. There is still a strong demand for bituminous coal from manufacturers and for general purposes.

Coke is in a little better supply, but far short of demand. No local furnaces have as yet gone out of blast on account of the shortage, as reported by a morning paper here. The Calumet furnace at South Chicago went out of blast prior to the Connellsville strike, and has not resumed on that account, but will shortly, as coke becomes more plentiful. West Virginia coke is quoted at $4.50@$5 and is in improved supply.

Prices of anthracite per ton of 2,000 pounds f. o. b. Chicago, are: Lehigh lump, $6.75; large egg, $5; small egg, range, and chestnut, $5. Retail prices per ton are: Large egg, $6.25; small egg, range, and chestnut, $6.50.

Prices of bituminous per ton of 2,000 pounds f. o. b. Chicago, are: Pittsburg, $3.25; Hocking Valley, $3; Youghiogheny, $3.40; Indiana block, $2.35@$2.50; Illinois block, $2@$2.20.

Coke.—Connellsville, 72-hour, per ton f. o. b. Chicago, $5.50; crushed, $5.40; Walston, $5.20; New River, $5.50.

Pittsburg.

May 7.

(From our Special Correspondent.)

Coal.—Coal continues firm with a good demand for local and other purposes. There have been no river shipments for some time; navigation is now confined to very light-draught steamers; mining will cease in the valley as soon as the emptics are loaded. Prices at this point are: River, wholesale in boats, $5@$6 per 100 bushels; railroad, $5@$5.50 per 100 bushels.

Connellsville Coke.—The output is increasing, and more than one-third enough ovens to supply the demand are now in blast. Production last week exceeded 36,000 tons. Prices are still abnormally high, but are rapidly coming down to "minimum figures." Prices are keeping far enough above the normal figure, however, to encourage a few more of the small operators to come to some agreement with the labor organization, with a view of making hay while the sun shines. It stands them in hand to be active; in all probability the sun will not shine very much longer. The strike may be prolonged a short time longer, but the ultimate outcome is no longer a matter of douht. The strikers are beaten; it may be put down for a certainty that the coke operatives will never make any terms with the present leaders. The week's increase in production was over 7,000 tons; week's shipments to Pittsburgh, 504 cars; west, 818; east, 249; total, 1,571. Prices uncertain, ranging from $1.85 to $2.50 per ton for furnace coke.

FREIGHTS.

From Philadelphia to: Alexandria,† 85c; Boston, 85c.@$1.05; Charleston, S. C., 75c.; Gloucester, Mass.,* 90c; Naponset, Mass., 90c.; New Bedford, 75c.; New York,† 90c.; Portsmouth,* 85c.; Providence, 75c; Richmond, 60c.; Rockport, Mass.,* $1; Saco, Me.,* $1.05; Washington, D. C.,† 85c.

* And discharging.
† Alongside.

METAL MARKET.

NEW YORK, Friday Evening, March 8, 1891.

Prices of Silver Per Ounce Troy.

May	Sterling Exch'ge	Lond'n Price.	N. Y. Cts.	May	Sterling Exch'ge.	Lond'n Price.	N. Y. Cts.
2	4 88½	45	98½	6	4.88½	44⅝	98¼
4	4.88	45⅛	99¼	7	4.88½	44¾	98
5	4.88½	44½		8	4.87¾	44¾	98

The United States Assay Office at New York reports the receipts of silver for the week to be 114,000 ounces.

Government Silver Purchases.

WASHINGTON, D. C., May 8.—(By telegraph). The Treasury Department purchased 414,000 ounces of silver to-day at prices ranging from .9815 to .984 per ounce.

Silver Bullion Certificates.

	Price. H.	Price. L.	Sales.
May 2	100	98¾	645,000
May 4	99⅞	99¼	345,000
May 5	99¼	98	568,000
May 6	98½	98½	60,000
May 7	98⅝	98⅜	192,000
May 8	98½	98⅜	120,000
Total sales			1,920,000

Coinage at the Mints of the United States.

The following statement shows the coinage executed at the mints of the United States during April, 1891:

Denomination.	Pieces.	Value.
Double eagles	86,000	$1,720,000
Eagles	9,000	90,000
Half eagles	22,000	110,000
Total gold	117,000	$1,920,000
Standard dollars	2,676,000	2,676,000
Half dollars	102,000	51,000
Dimes	1,660,000	166,000
Total silver	4,438,000	$2,893,000
Five cents	742,000	37,100
One cent	1,330,000	13,300
Total minor	2,072,000	50,400
Grand total	6,627,000	$4,863,400

Domestic and Foreign Coin.

The following are the latest market quotations for American and other coin:

	Bid.	Asked.
Trade dollars	$ .76	$ .79
Mexican dollars	.76	.77
Peruvian soles and Chilian pesos	.73½	.75
English silver	4.86	4.88
Five francs	.94	.95
Victoria sovereigns	4.87	4.89
Twenty francs	3.87	3.88
Twenty marks	4.75	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.80	4.85
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.60
Ten guilders	3.96	4.00
Bar silver	.98⅛	.98¾

Foreign Bank Statements.

The governors of the Bank of England, at their weekly meeting on Thursday, raised its minimum rate of discount from 3½% to 4%. In the week the bank lost £540,000 bullion, and the proportion of reserve to liabilities was reduced from 34·81% to 33·35%, against an advance from 41·03% to 41·49% in the corresponding week last year, when its discount rate was unchanged at 3%.

Copper.—We have hut little change to report in this metal, which, as far as this market is concerned, continues in a very unsatisfactory and lifeless condition. The demand on the part of manufacturers is almost at a standstill, as it now appears, not so much on account of the price as for lack of orders. The prices for Lake copper have been more or less of a nominal character, but we understand that a good deal of cutting has been going on and that small orders have been taken at 13¼c., not alone for copper held in second hands, but also by some of the Lake companies. Casting copper is in tolerably good demand at prices ranging from 11¾c. to 11¼c. Arizona copper continues neglected, but is not pressed for sale, there being hut little of a surplus, as Arizona pig is continually being shipped abroad, so that there has been no accumulation of stocks. We quote the former at 12¾c. and the latter 11¼c.

The London market has, in contrast to ours, shown considerable firmness early in the week, and whilst the market closed on Friday last at £51 10s. for spot and £51 17s. 6d. for futures and opened Monday at £51 17s. 6d. for spot and £52 10s. for futures, it reached on Tuesday £52 for spot and £52 12s. 6d. for futures, but has since eased off a little owing to freer offerings, and closed today at £51 5s. for spot and £51 15s. for futures. We understand that the better tendency was brought about by a scarcity of spot G. M. B.'s which is likely to continue, as the stock of this commodity has been rather considerably reduced in the last few months, supplies being but very meagre on account of the interruption of shipments from Chili. The statistics for the second half of April show an increase of 800 tons or a total for the month of 1,200 tons.

We quote: English tough, £53 10s.@£54; best selected, £55@£55 10s; strong sheets, £58 15s.@£59; India sheets, £57@£57 10s.; yellow metal sheets, 5½d.

The exports of copper during the past week were as follows:

To Havre—	Copper.	Lbs.	
By S. S. La Bretagne	288 pigs.	43,520	$5,315
" "	1,518 bars.	204,085	28,000
To Rotterdam—	Copper.	Lbs.	
By S. S. Maasdam	1,287 pigs.	336,570	$40,977
" "	357 cakes.	112,154	13,978
To Liverpool—	Copper Matte.	Lbs.	
By S. S. Germanic	3,158 bags.	357,501	$25,000
" City of Chester	4,158 "	443,061	30,000
" Cufic	5,559 "	570,105	40,000
To Liverpool—	Copper.	Lbs.	
By S. S City of Chester	45 casks.	56,000	$6,720
To Bremen—	Copper.	Lbs.	
By S. S. Aller	210 pigs.	44,916	$5,000

Tin.—The better tone prevailing at the end of last week has made further progress, and prices advanced steadily to 20·20c. until Thursday morning, when low cables from London brought out free sellers at lower values, all of the tin offered, however, being taken up by the same parties who bought rather large quantities a few weeks ago. Had it not been for their purchases, the market would probably have gone much lower, as there is still a great deal of tin controlled by people who hold it for a further rise, but who have been disappointed by the reaction. In all from 800 to 1,000 tons have been traded within the last week, most of which, as mentioned above, has been acquired by one interest. We quote to-day for spot, 20·10c.; May, 20·10c.; June, 20·10c.; July, 20·15c.; August, 20·20c.

The London market, after advancing to £91 12s. 6d. for spot and £91 2s. 6d. for futures, reacted on Thursday, the closing quotation on that day being £90 17s. 6d. spot and £90 10s. futures, and it closes to-day at £90 12s. 6d. for spot and £90 2s. 6d. for futures. The fact that spot commands a premium of 10s., which on Thursday was even 7s. 6d. more, shows, by itself, that tin for immediate delivery in London is rather scarce. Statistics for the second half of April show a decrease of 1,100 tons.

Lead has been very dull throughout the week, hardly any business having been done. Were it not for the reluctance of refiners to sell anything at lower prices, the market would surely have given way considerably, as the demand is practically *nil*, and it appears that even at lower prices it is not likely to revive much. A few carloads only have changed hands, and these at 4¼c.@4·30c., and the metal is being freely offered at the latter figure.

London cables quote Spanish at £12 12s. 6d., and English at £12 15s.

Chicago Lead Market.—Messrs. Everett & Post telegraph us as follows: "The market has been very evenly balanced. Early in the week lead seemed scarce, and sales were made at 4·10c.@4·12½c. Later there was more disposition to sell manifested by some holders, and prices eased off a trifle. The closing is quiet at 4·05c. bid, 4·10c. asked."

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: "Lead strong, but quiet. About 500 tons were sold during the past week at 4@4·02½c. The closing is firm at 4·05c. asked."

Spelter continues unchanged, the demand being just as unsatisfactory as on the whole line of metals. Galvanizers are well supplied, and so are many of the brass mills, in consequence of business not having been what they expected, thus leaving on their hands considerable quantities that they expected to have consumed ere this. We quote spot and near delivery 4·90c.

London was rather a little firmer early in the week, but the better tone has not made much progress since, and the market is falling back into its accustomed monotony. We quote specials £23 and ordinaries £22 15s.

Antimony continues rather unsettled. We quote: Cookson's, 16c.; Hallett's, 14¾c.; L. X., 15¼c.

Quicksilver.—The demand is not very encouraging, but as no great quantities are pressing on the market, values have been steadily maintained at $43. The London market shows signs of recovering from the recent slump; last sales were made at £8.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 9.

Reports from inland cities indicate a rather improved condition of affairs in the iron market this week. The change is by no means pronounced, but after the long stagnation in the trade the slightest breeze from a favorable quarter is sufficient to give a better tone to the market. There are some disturbing elements yet, however, and until these are out of the way it is unlikely that there will be any pronounced or permanent change in the situation. The coke strike is still undecided, and as long as this remains unsettled the condition of the iron market must be one of uncertainty. It is undoubtedly feared that with a general resumption of work in the Connellsville region, and an abundant supply of coke, many furnaces will blow in again, and that a heavy increase in production, which would certainly weaken the market again, will be made.

The local iron market, which was dull last week, has fallen flat during the present, on account of the general strike of the housesmiths and many of the foundrymen. Dealers are maintaining prices firmly, but the current business is very small indeed.

American Pig Iron.—There has been very little doing, the demand from the foundrymen having fallen off so considerably on account of the labor difficulties which have prevailed since the first of the month. Prices remain unchanged, and we quote: Northern, No. 1 X, $17 50@$18; No. 2 X, $16.50@$17; Southern, No. 1 X, $17.50@$18; No. 2 X, $16.50@$17.

The demand for Scotch pig iron shows no change. Small lots are constantly arriving, but are entirely on orders.

Spiegeleisen and Ferro-Manganese.—The demand for ferro-manganese is almost *nil*, and few transactions are reported. The price of the material, abroad, has risen on account of the labor difficulties in the coal trade, in Germany. Nominal quotations are somewhat higher here, but the

condition of affairs excites little interest. We quote: Spiegeleisen, 20%, $27.50@$28.50; ferromanganese, 80%, $64@$65.

Steel Rails.—Business has been dull. A few transactions have been reported, but none of much consequence. The price is maintained firmly at $30 at the mills. There was a rumor current during the past week that an order for a lot of rails had been taken by an Eastern mill outside of the association which had not rolled any rails for several years. The only foundation for this, so far as we were able to learn, was that a quotation had been made on a lot of unsold rails, but the size of the lot was exaggerated.

Rail Fastenings.—Nothing definite can be learned regarding the meeting of spike manufacturers held in this city last week. If any movements were made to advance the price, however, it is evident that it did not succeed, as quotations remain at about the same figures that have prevailed for some time past.

Business in fastenings has been dull. There was a little spurt after the railways placed their orders for rails a few weeks ago, but the improvements fell off with that of the steel rail trade. We quote prices: Spikes, 1·95@2c.; angle plates, 1·70@1·80c.; bolts and square nuts, 2·65@2·75c.; hexagonal nuts, 2·85c; complete joint, iron and steel, according to weight.

Tubes and Pipe.—There is no particular change to note. We quote discounts on car-load lots as follows: 47½% on butt, black; 40% on galvanized; 60% on lap, black; 47½% on lap, galvanized; boiler tubes, 50% on all sizes; casing, all sizes, 50%.

Structural Iron and Steel.—Business is at a standstill on account of the strike of the housesmiths. The bill before the legislature regulating the use of wrought iron and steel columns in buildings was killed in the Senate before the adjournment, through the influence of the rolling mill companies. Prices for structural material remain unchanged. We quote, nominally: Universal plates, $2.15; bridge plates, $2.10; angles, $2.20; beams, $3.10.

Merchant Steel.—Business continues in about the same condition as last week, showing no further falling off. The outlook for the future is not considered by dealers to be the brightest. The business in merchant steel is done for the most part by long contracts, and there is an indisposition on the part of buyers to place large orders without concessions in prices. We quote: Best English tool, 15c., net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3¾c.; open-hearth machinery, 2·60c.; open-hearth spring, 2·60c.; tire steel, 2·60c.; toe calks, 2·60c.; first quality sheet, 10c.; second quality sheet, 8c.

Old Rails.—The market is quite lifeless. Prices are, if anything, a little weaker. We quote $21.50@$22.50 for tees and $25 for doubles.

Wrought Iron Scrap.—There is nothing doing. We quote, nominally, $21@$22 at yards.

Chicago. May 7.

(From our Special Correspondent.)

There is quite a good tone in pig-iron circles, and demand is very fair for all grades, with some stiffening up for certain brands. Quite an improved feeling is also noticeable in manufactured iron and steel, and prices on some specialties have slightly improved. Structurals are in excellent inquiry both locally and from the outside, and it now looks as though the deadlock of depression was broken; but everything depends upon the outcome of the crops which is now the most important factor of the situation. If they are good, railroads will have to take in considerable supplies for car and general repair work. Quite a number of railroads east and west of here are side-tracking cars out of repair, so that when they do get ready orders will come in with a rush.

Pig Iron.—Demand is improving, prices hardening, and inquiries are now quite good for lots of moderate size. Local coke iron is moving more freely, and some buyers are inquiring with a view to cover for the next six to eight months. Prices are firm. There is now very little if any of the cheap lots of charcoal left, and regular quotations are now $17.50@$18.50. The better grades of coke foundry irons are becoming scarce in this market, and values are improving. Southern iron is not pressing for sale, being unable to compete with that of local furnaces. Softeners are still scarce and in demand.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $17.50@$18.50; Lake Superior coke, No. 1, $15.50@$16; No. 2, $15@$15.50; No. 3, $14.50@$15; Lake Superior Bessemer, $17; Lake Superior Scotch, $16.50@$17; American Scotch, $18.50@$19; Southern coke, Foundry No. 1, $16.25; No. 2, $15.75; No. 3, $15.25; Southern coke, soft, No. 1, $15.75; No. 2, $14.75; Ohio silveries, No. 1, $18; No. 2, $17; Ohio strong softeners, No. 1, $18.50; No. 2, $17.50; Tennessee Charcoal, No. 1, $18; No. 2, $17.50; Southern Standard Car Wheel, $21@$23.

Structural Iron and Steel.—Inquiry is quite large and there is plenty of work in sight. St. Louis is calling for figures on a million and a half dollar depot, a large brewery plant and a municipal library. Local demand is excellent. Quotations remain unchanged for car lots f. o. b. Chicago: Angles, $2.20@$2.25; tees, $2.75@$2.85; universal plates, $2.35@$2.45; sheared plates, $2.40@$2.50; beams and channels, $3.20.

Plates.—Some of the larger boilermakers are inquiring for stock. Mill business is rather quiet, but trade from warehouse continues moderately good. Tubes are weak. Quotations remain unchanged: Steel sheets, 10 to 14, $2.70@$2.80; iron sheets, 10 to 14, $2.60@$2.70; tank iron or steel, $2.50@$2.70; shell iron or steel, $3@$3.25; firebox steel, $4.25@$5.50; flange steel, $3.25@$3.40; boiler rivets, $4.25; boiler tubes, 2¼ inches and smaller 55%, larger than 2¼ inch 60%.

Merchant Steel.—There is only a limited demand for soft steels, but we hear of several round lots of spring steels being booked. Tool steel is in fair request. Prices remain unchanged: Tool steel, $6.75@$7; tire steel, $2.30@$2.50; toe calk, $2.50@$2.65; Bessemer machinery, $2.20@$2.30; open-hearth machinery, $2.60@$2.75; open-hearth spring, $2.75@$3; crucible spring, $3.75@$4.

Steel Rails.—Light sections of steel rails for street railways, etc., are in better inquiry and demand than heavy-weight steel rails. Some inquiries for round lots of standard sections are and have been under negotiations for quite a while, but hang fire. Quotations remain unchanged at $31@$32.50 per ton f. o. b. Chicago. Splice bars at $1.95@$2 for steel and $1.85@$1.95 for iron, and spikes at $2@$2.10 per 100 pounds.

Galvanized Sheet Iron.—The past week has witnessed some lively buying, and inquiry for mill lots is quite active. Discounts are unchanged, but not very firm, at 67% off on Juniata and 65% and 5% off on charcoal.

Black Sheet Iron.—There is quite a large volume of business to place and inquiry is improving. Many mills are unwilling to quote for late summer deliveries. The feeling is much better than a week or ten days ago. Quotations, according to quality, are $2.85@$3 for No. 27 f. o. b. Chicago for car lots.

Bar Iron.—There is some improvement in demand, and the market is stronger in tone. Several agricultural implement manufacturers are inquiring for season's supplies, evidently impressed with the low prices which have been prevailing. Demand from railroads and car builders will be large, and prices are already on the upward turn. Mill agents are confident that in a very short while the market will become active and strong. Local mills now quote 1·65c., and Valley Mills, 1·55c., half extras at mill. Out of store prices are 1·85@2c., according to quantity and quality, and trade fair.

Nails.—Steel cut are in better demand, and some large orders booked for deliveries through May and June. A firmer feeling is perceptible with regard to mill prices, which are now $1.60. Wire nails are also in better request. Demand from store is improving, and prices are $1.80 for steel cut, and $2.30 for wire in small lots.

Scrap.—Some 200 to 300 town lots of wrought scrap sold at $22.50@$21.50, but most other grades are extremely dull and the market heavy. Prices are mostly nominal. Quotations per net ton f. o. b. Chicago are: No. 1 railroad, $18.50; No. 1 forge, $18; No. 1 mill, $14; fish-plates, $21; axles, $23.50; horseshoes, $18; pipes and flues, $13; cast borings, $8; wrought turnings, $11; axle turnings, $13; machinery castings, $11.50; stove plates, $8; mixed steel, $11; coil steel, $15.50; leaf steel, $15.50; tires, $17.

Old Rails and Wheels.—Iron and old steel rails are very dull, and in the absence of sales to govern prices we quote $22.50, but they could probably be bought for less. Steel rails, mixed lengths, are $13.50, and selected, long, $16@$16.50. No movement in old wheels at $16.50.

Cleveland. May 7.

(From our Special Correspondent.)

Only three or four boats have yet started out for iron ore. It certainly looks as if the ore men had made up their minds not only not to be in a hurry about bringing down their ore, but almost as if they were not going to bring down any at all unless previously sold. The situation at the docks will influence them largely as to the latter point.

A request was recently made of the Pennsylvania Company (managing large docks both at Erie and Ashtabula) to give the usual space for a certain amount of an ore which it has always handled, and which is all sold. The response is as follows: "It is impossible, as yet, to advise you whether we can give you any space for this ore or not. The docks are already so full that unless it moves more freely we will have but little space to assign to anybody."

No new sales have been made, except a few to the mills for "fix" purposes.

The situation in the Mahoning and Shenango valleys is unchanged. Furnace managers in that district do not see how it is possible to resume operations until the concessions asked for by them from the coke producers and the railroad men are granted. They did not name a low rate in order to make a compromise, but the figure they fixed upon was arrived at as being absolutely necessary for them in order to compete with Southern iron. The railroad people are blind to the situation. The mine railroads say they do not care to reduce unless the lower Lake railroads do likewise, and unless the coke railroads and coke producers also stand their share of the reduction. Between these jarring and conflicting interests, it looks as if the Northern iron industry would suffer serious loss. In the meantime the Southern district is increasing in production and gaining strength at the expense of the Northern district. Unless the coke producers and railroad men and laborers can soon reconcile themselves to stand a fair share of this competition, the Northern iron industry will so seriously suffer that it will be difficult to regain its former position in the iron markets of the country.

We note, this week, some slight changes from previous quotations, viz.:

Specular and Magnetic Ores.

Bessemer	66 @ 69%	$5.50@$6.00
"	60@64%	4.25@ 5.00
Non-Bessemer	56@60%	4.50@ 5 00
" "	62@65%	4.00@ 4.50
" "	57@60%	3.50@ 4.00

Soft Hematites Dried at 212°.

Bessemer	62@65%	$4 25@$4.75
"	58@61%	4 00@ 4.25
Non-Bessemer	55@63%	3.50@ 4.25

Above prices are for deliveries on docks at Lake Erie perts.

Louisville. May 2.

(Special Report by Hall Bros. & Co.)

There is nothing of special interest to be said about the iron market. Sales have been mostly in small quantities, though a few large inquiries are reported, but not developed into trades. A very liberal buying movement cannot be expected until the consumers have orders to justify round purchases which many claim not to have now, though the outlook appears somewhat better. We quote prices:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14.25@$14.50; No. 2, $13.75@$14; No. 3, $13.25@$13.50. Southern charcoal, No. 1, $16.50@$17; No. 2, $16@$16.50. Missouri charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17.

Forge Irons.—Neutral coke, $12.50@$13; cold short, $12.50@$13; mottled, $12@$12.25.

Car Wheel and Malleable Irons.—Southern, standard brands, $19.50@$20.50; Southern, other brands, $17.50@$18. Lake Superior, $20.50@$21.50.

Philadelphia. May 7.

(From our Special Correspondent.)

Pig Iron.—The situation has not changed, excepting that there is a stronger disposition to buy iron. Buyers everywhere insist on being supplied at the lowest prices heretofore ruling. Quotations for No. 1 Foundry are $17.50@$18; No. 2, $16.50@$17; forge, $14.50@$15; with Southern No. 1 Foundry selling at $17@$17.50 and No. 2 at $16. Bessemer is selling at $19@$20; liberal offerings are being made. A good many buyers are on the market, looking for favorable opportunities, and heavy transactions may take place any hour.

Ferromanganese.—Quotations are $54@$65.

Steel Billets.—Quotations are $27.50@$28; small lots are being taken almost every day.

Muck Bars.—Quotations $26.50@$27 delivered. Holders are firm at these figures. Much more muck bar would sell if buyers were satisfied that present asking rates are bottom rates.

Skelp Iron.—The demand for skelp is irregular. Quotations are $1.70@$1.85.

Wrought Iron Pipe.—An irregular demand is met with, but buyers are rather opposed to placing large orders just at present. Manufacturers predict a much heavier demand by the last of this month, based on inquiries which have just been received.

Sheet Iron.—The Sheet Mills are not all running full time. Quotations for best refined range from 3@3½c.

Merchant Iron.—There is great anxiety among manufactures for business, and this keeps prices down to 1·65@1·85c., according to size of order and quality of iron.

Plate Iron.—The irregular demand for the past month still continues; manufacturers are rather disappointed. A few mills are well supplied, but the larger number are without a sufficient run of business to keep prices firm. Tank is 2·10c. for small lots, in steel 2·20c. Shell, 2·30c@2·50c; flange 3·25c. for iron.

Structural Iron.—Only small orders continue to drop in, and in this way the mills are kept moderately supplied with business. Quotations: 2@2·10c. for angles and sheared plates. Tees, 2·50c. Beams and Channels, 3·10c.

Steel Rails.—Sales are being made at $30.50 in small lots.

Old Rails.—Old rails are offered at $22.50@$23 delivered.

Pittsburg. May 7.

(From our Special Correspondent.)

Raw Iron and Steel.—The market has undergone scarcely any change since our last report. The heavy operations noted in this column during the past two weeks have pretty well supplied the market with the kind of iron and steel most required for immediate use. The condition of affairs in general is such that those engaged in the business are disposed to move with a considerable degree of caution, as it is yet too early to make any calculation what effect the strike inagurated on the first will have on trade generally.

Prices have been fairly well maintained. Some houses in the trade consider that the tendency is toward an improvement, both in prices as well as demand, while others have an entirely contrary opinion. This is probably due to the fact that those who have a long-established trade have a con-

tinuous run of orders which enables them to market their entire output without difficulty at quoted rates. Those whose brands are less favorably known, or where that particular grade is not wanted, have no alternative but to shade prices. There is more business in some departments and firmer prices in others; but the improvement is of an irregular and spasmodic character.

The late dullness seems to be surely passing away, and the talk about lower prices is no longer regarded with any feeling of apprehension. Some specialties are firmer, others are held at an advance, and in no case can any positive decline be noted. City furnace-made iron always commands the highest range of prices ruling in the market. This speaks well for those engaged in making Bessemer and Grey Forge.

No further sales of iron ore have been made; the prospects are good, however, for several large contracts being made soon, of which our readers will be fully advised. Prices are the same as noted in our last. Reports from the Shenango and Mahoning valleys represent the stock of Bessemer and Grey Forge reduced to a very limited amount. Parties who visited these points for the purpose of contracting for a few thousand tons came back disappointed. Spot Bessemer is scarce and commands top prices; future deliveries not so much fancied, owing no doubt principally to the uncertainty of the labor troubles and the coke question.

No large sales of steel rails have been made since last week. Average cash prices for Bessemer pig during the past four months have been as follows: At Pittsburg for January, $16; February, $16.37; March, $16.40; April, $16.50. The situation during the past week may be summed up as follows: Bessemer pig, prices maintained. Steel slabs and billets, unchanged. Ferromanganese, New York delivery, 50 cents higher. Muck bar, later delivery, higher. Bloom and rail ends, firm. Steel wire rods, advanced. New steel rails, steady at previous quotations. Skelp iron, wide and narrow grooved, advancing. Grey frogs, firm at last week's prices. Charcoal irons, unchanged. Old iron and steel rails, demand fell off. Scrap material, not very active, with no change in prices.

Coke Smelted Lake and Native Ores.

3,000 Tons Bessemer	$17 00 cash.
2,500 Tons Bessemer	17.00 cash.
1,850 Tons Bessemer, spot	17.25 cash.
1,500 Tons Bessemer, May	17 50 cash.
1,500 Tons Bessemer, spot	17.25 cash.
1,000 Tons Grey Forge	14.40 cash.
1,000 Tons Bessemer	17.00 cash
1,000 Tons Grey Forge	14.10 cash.
800 Tons Grey Forge, at city furnace	14.00 cash.
500 Tons Grey Forge, at city furnace	14.25 cash.
500 Tons Grey Forge	14.00 cash.
500 Tons Grey Forge	14.25 cash.
500 Tons Grey Forge	14.00 cash.
500 Tons Grey Forge	14.25 cash.
500 Tons Grey Forge, at valley furnace	14.20 cash.
500 Tons Grey Forge	13.90 cash.
300 Tons Grey Forge	14.25 cash.
250 Tons Bessemer	17.50 cash.
250 Tons Grey Forge, Southern	13.75 cash.

Charcoal.

100 Tons No. 2 Warm Blast	22.50 cash.
100 Tons Cold Blast	26.00 cash.
50 Tons Warm Blast	23.00 cash.
50 Tons No. 2 Foundry	22.00 cash.

Muck Bar.

750 Tons Neutral May and June	26.50 cash.
500 Tons Neutral May	26.00 cash.
500 Tons Neutral	26.50 cash.
500 Tons Neutral	26.25 cash.

Steel Slabs and Billets.

4,500 Tons Billets, May and June	25.50 cash.
3,000 Tons Billets, May, June, July	26.00 cash.
2,000 Tons Billets, Wheeling, Del	25.50 cash.
500 Tons Billets, May	25.75 cash.

Steel Wire Rods.

350 Tons American fires	37.00 cash.

Ferro-Manganese.

60 Tons 80%, New York	65.00 cash.
50 Tons 80%, Baltimore	64.00 cash.

Bloom and Rail Ends.

1,200 Tons Bloom and Rail Ends	17.25 cash.

Skelp Iron.

700 Tons Sheared Iron	1.85 4 m
300 Tons Wide Grooved	1.65 4 m.
185 Tons Narrow Grooved	1.62½ 4 m.

Old Steel Rails.

200 Tons Short Pieces	17.00 cash.

Scrap Material.

300 Tons Wrought Iron Punchings, net	16.50 cash.
200 Tons No. 1 W. Scrap, Net	20.25 cash.
150 Tons Cast Borings, Gross	11.00 cash.
150 Tons Cast Scrap, Gross	14.50 cash.
100 Tons No. 1 W. Scrap, Net	19.00 cash.
100 Tons No. 2 W. Scrap, Net	18.00 cash.
100 Tons W. Iron Turnings, Net	15.00 cash.
100 Tons Soft Steel, Gross	17.50 cash.
100 Tons Iron Axles, Net	26.50 cash.
50 Tons Stove Plate, Gross	11.00 cash.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 8.

While no great change has been noticeable in the general condition of this market, an increased demand for both caustic soda and alkali has done a good deal toward restoring the confidence of dealers and leaves both chemicals rather scarcer and firmer than at the end of last week. Caustic soda is no longer so much of a drug on the market, but is still changing hands at prices rather below what it could be brought in for. 48% and 58% alkali of the various makes have met with a good deal of inquiry; and notwithstanding the fact that they have both come in extensively, the market is pretty well sold up. The position of bleach is also commencing to show some signs of improvement; the demand has not increased very materially, but the restricted production cannot fail to have some effect.

The brimstone market continues firm at our last figures. Spot goods are very scarce, and for forward shipments the downward movement seems to have been checked, temporarily at least.

Nitrate of soda weakened a little during the early part of the week, but now very little remains on dock, most of it either being stored or in second hands, so that dealers are commencing to ask a little more and the market generally has become firmer.

Caustic Soda, 60%.—During the last two or three days rather more inquiry resulting in sales has been noted, so that the large arrivals of this week and the previous one do not continue so much of a burden. Shipments during May and June have offered at 3·27½@3·32½c., but business has not been extensive at these figures.

70@74%.—Arrivals have been very large, and under the pressure of keen competition concessions have been made. Some sales as low as 2·97½@3· are noted, but these figures seem to have considerably relieved the market, as now buyers are not so much in demand and a generally much better tone prevails. Dealers are now holding out for 3@3·05c. and some most recent sales have been made at 3·07½c. At these figures the demand is reported fair.

77%.—This chemical continues well sold ahead. Nothing lower than 3·07½@3·12½c. is named and no stocks are allowed to accumulate, almost everything coming in sold.

Alkali, 48%, has met with a good demand, and notwithstanding large arrivals closes firm at 1·57½@1·62½c. Considerable inquiry for forward shipments has resulted in extensive sales. High test B. M. has also come in very freely, but as the larger part was on contract and the demand has been very good dealers have declined to shade 1·47½@1·52½c., at which the market closes firm. Holders of some of the other makes have not fared so well and have been forced to do some lively hustling. 1·37½@1·40c. has been asked and in some cases even shaded. This stock of outside makes is now, however, said to be pretty well disposed of in one way or another, and business could probably not be done at much under 1·40c

Caustic Soda Ash, 48%.—Nothing doing, no demand and nothing offering.

Sal Soda.—The position of this chemical is rather better than it has been. An increased demand has made itself felt and stocks have been very much reduced, so that the demands of dealers have increased. Nothing could now probably be done under 1@1·05c. Domestic sal soda is still in a very strong position. The demand continues very good and is satisfied at from 1 to 1·05c. f. o. b., less 1½% for cash, as to quantity and style of package.

Bleach.—The demand has shown some signs of improvement, and, under the influence of restricted production, values have become much firmer, and at present dealers are quoting 1·75@1·80c. Stocks are commencing to show some signs of depletion.

Acids.—The meeting of the acid manufacturers took place last Tuesday, and most of the dealers interested stayed over till Wednesday afternoon, when they finally adjourned. We have been unable to obtain any account of what took place, it being evidently the intention of those who were present to wait until some further details of any proposed agreement are arranged. The demand for sulphuric acid throughout the week has been very good, and prices have been well maintained. The acetic acid market continues very demoralized. Nothing more than a jobbing demand has made itself felt, and competition among makers has reduced values very materially; 1·45@1·70c. is now being asked.

We quote acid per 100 pounds in New York and vicinity: Muriatic, 18°, 80c.@$1; muriatic, 20°, 90c. @$1.10: muriatic, 22°, $1@$1.20; nitric, 40°, is selling for $4.50, and from that upward, according to quantity, etc.; nitric, 42°, $5@$5.25; sulphuric, 60°, 80c.@$1.55; sulphuric, 66°, 95c@$1.12½, at which figures the market closes firm.

Fertilizers.—Under the influence of restricted production due to the difficulties of the South Carolina River phosphate miners, the industry in Florida is becoming daily more important. In 1889 the first Florida phosphate company commenced to mine on a small scale, and since then the industry has grown with wonderful rapidity. This district is now making a daily production of about 2,000 tons of phosphate rock. Our last quotations for phosphate rock still hold good, $6.50@$7.50 f.o. h. vessels and cars at mines, wet and dry respectively. Ground rock is selling here at $11, bags returnable. On the other side values for sulphate of ammonia, made from gas liquor, have developed quite an upward tendency and as a consequence for forward shipments 3·25c. is probably the lowest figure at which business could be done. For spot goods dealers are asking 3·20@3·25c.

The position of bone sulphate remains much the same. The arrivals have been pretty well taken up and, without any scarcity developing, prices remain firm at 3.15@3·20c. Dried blood is in much better supply that a fortnight since, and as the demand has ceased to be quite so active values have suffered. No better than 1.95@2c. could now be done for high-grade blood, and low-grade is held at 1·90@1·95c. Azotine is not in very large stock, but prices have declined slightly in sympathy with high-grade blood. We quote 2c.

Bone black has undergone no change. The demand continues fair, and is supplied at $20; for dissolved bone black $1 per unit is being asked. Bone meal is meeting with a good consumptive demand at from $22.50 to $23.50. Sulphate of potash has come in freely, but mostly on contract; and as the demand has been good throughout the week, spot goods are held slightly higher. For forward shipment syndicate prices are being asked. Double manure salt is in demand with but small stocks available at 1·12½@1·15c.

Muriate of Potash.—The spring business is nearly over, so that inquiry is almost entirely confined to summer and fall shipments. This resulted in sales of about 400 tons. Arrivals at all ports amounted to about 300 tons. Business in spot goods is hardly more than of a jobbing nature, and is done at regular syndicate's agent's prices.

Brimstone.—Spot goods continue very scarce. As a matter of fact no quotation has been given on Sicilian goods. Some Japan brimstone is held at $34. For forward shipment the price has been well maintained; for May-June shipments $31@$32 could probably not be shaded. Thirds are selling at from 75c. to $1 less than seconds.

Nitrate of Soda.—The recent large arrivals have been nearly placed. Dealers desiring to save themselves the expense of storing have in some cases made material concessions. Sales are said to have been made at as low as 2@2·10c. This incubus is pretty well got rid of, and the market closes firm at 2·15c., with very little in store. No further arrivals will now probably come in until July, nothing earlier than March shipments having been heard from.

Saltpetre.—Business has been very quiet, and only a small jobbing demand filled at 3¾@4c. has been noted.

Liverpool. April 29.

(Special Correspondence by J. P. Brunner & Co.)

Heavy chemicals are in a very lifeless state; buyers show no disposition to operate except from hand to mouth, and appear to have little confidence in present prices. At the same time values remain unchanged, the "Union" declining to make any concession.

Soda Ash is quiet, and minimum quotations are as follows: Caustic ash, 48%, £5 2s. 6d.; 58%, £6 4s., net cash. Carb. ash, 48%, £5 7s. 6d.; 58%, £6 10s., net cash. A premium on these prices is demanded for special brands.

Soda crystals are not active, but there is little offering and prices are steady @ £3 7s. 6d. to £3 10s. per ton, net cash.

Caustic soda dull, some resales have been made @ 2s. 6d., under Union quotations. Syndicate quotations are as follows: 60%, £9 10s. to £9 15s.; 70%, £10 15s. to £11; 74%, £11 15s. to £12; 76%, £13 upward, according to quantity and delivery, and all net cash.

Bleaching powder shows no improvement, and minimum quotation remains at £7 per ton net cash. A little could no douht be had from second hands at 1s. 3d. to 2s. 6d. per ton less.

Chlorate of potash is steady at 5⅜d. to 5½d. per pound, less 5%.

Bicarb. soda is in demand at £6 15s. to £7 per ton, less 2½% for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia shows little change, although prices are, if anything, a shade easier at £11 to £11 2s. 6d. for good gray 24% in single bags, and £11 12s. 6d. per ton for 25% in double bags f. o. h. here. Buyers are holding aloof in the expectation of being able to do better, while, on the other hand, makers are not inclined to make concessions.

BUILDING MATERIAL MARKET.

NEW YORK, Friday Evening, May 8.

This period of the year has come to be a regular time of dissension between wage-earners and employers, when the subject of remuneration is given a thorough airing; and men interested in building materials have long ago recognized the necessity of being prepared for one thing or another in the line of boycotts, strikes, etc, at this time of the year. The action of the Housesmiths' Union, to which reference was made in this column last week, caused the iron molders to stop work. And later the Lumber Handlers' and Lumber Truck Drivers' Association decided to try its luck, so that building during the week has been very much restricted, and it still remains a matter of uncertainty when these troubles will be properly settled.

Bricks.—Not many brick have come in, but the stocks on hand at the opening of the week were amply sufficient to supply all demands. Even now there are large quantities of low-grade brick to be had; but the best are much scarcer, and doubtless some premium would have to be paid if a buyer wanted to be particular. We quote: Haverstraws at from $6 to $6.50. Pale are changing hands in pretty large quantities at $2.25 per M, and Jerseys and Keyports are held at from $4.50 to $5.50 per M.

Lime.—Dealers, quite generally, have been materially curtailing arrivals in anticipation of the May labor difficulties, and as a consequence stocks now are quite small. The demand has been very insignificant, and has been filled at our last quotations. Rockland common is selling for 90c. and finishing for $1.

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and Amount of last			Dividends. Total paid.	Date & amount of last.		
1	Adams, S. L. C.	Colo.	$1,500,000	150,000	$10	*				$570,000	April	1891	.05
2	Alice, S.	Mont.	10,000,000	400,000	25	*				920,000	April	1891	.06¼
3	Alma & Nel Wood., G.	Idaho	300,000	30,000	10	*				60,000	Jan.	1889	50
4	Amador, G	Cal.	1,250,000	250,000	5	*				31,250	Aug.	1890	.12½
5	American Belle, S.G.C	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
6	Americ'n & Nettie, G.S	Colo.		300,000						150,000	Nov.	1889	.10
7	Amy & Silversmith, S.	Mont.		341,419						247,530	Aug.	1887	.12½
8	Atlantic, C.	Mich.	1,000,000	40,000	25	$280,000	April	1875	$1.00	700,000	Feb.	1891	1.00
9	Argenta, S.	Nev.	10,000,000	100,000	100	335,000	July.	1889	.10	40,000	Feb.	1880	.20
10	Aspen Mg. & S., S. L.	Colo.	2,000,000	200,000	10	*				640,000	April	1891	.10
11	Aurora, I.	Mich.	2,000,000	100,000	20					255,000	Mar.	1891	1.00
12	Badger, S.	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
13	Bangkok Cora-Bell, S.	Colo.	600,000	600,000	1	*				44,510	Aug.	1890	.00½
14	Belle Isle, S.	Nev.	10,000,000	100,000	100	190,000	Dec.	1889	.15	300,000	Dec.	1879	.25
15	Belcher, S. G.	Nev.	10,400,000	104,000	100	2,978,000	Feb.	1891	.50	15,397,000	April	1876	1.00
16	Bellevue, Idaho, S. L.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.10
17	Bi-Metallic, S. G.	Mont.	5,000,000	200,000	25					550,000	Mar.	1891	.35
18	Bodie Con., G. I.	Cal.	10,000,000	100,000	100	550,000	June	1890	.25	1,602,572	April	1885	.50
19	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
20	Boston & Mont., C. S.	Mont.	2,500,000	100,000	25	*				1,825,000	May.	1891	1.00
21	Breece, I.	Colo.	5,000,000	200,000	25	*				2,000	Feb.	1880	.01
22	Brooklyn Lead, L. S.	Utah.	500,000	50,000	10					127,000	July.	1887	.05
23	Bullion, Beck. & C., S. L	Utah.	1,000,000	100,000	10					730,000	Nov.	1890	.50
24	Bulwer, G.	Cal.	10,000,000	100,000	10	130,000	Aug.	1889	.25	175,000	Jan.	1884	.10
25	Bunker Hill & S. S.L.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1883	.06⅔
26	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000	May.	1885	.15	192,000	Oct.	1890	.08
27	Calliope, S.	Colo.	1,000,000	1,000,000						140,000	Jan.	1891	.00½
28	Calumet & Hecla, C.	Mich.	2,500,000	100,000	25	1,200,000				35,350,000	Jan.	1891	5.00
29	Carlisle, G.	N. M.	1,000,000	200,000	5					175,000	Dec.	1888	.12½
30	Catalpa, S. L. I.	Colo.	3,000,000	300,000	10	*				270,000	May.	1884	.10
31	Centen'l-Eureka, S.L	Utah.	1,500,000	30,000	50					232,500	April	1891	.50
32	Central, C.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
33	Chrysolite, S. L.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
34	Clay County, G	Colo.	200,000	200,000	1	*				21,000	Mar.	1891	.02
35	Cœur D'Alene, S. L.	Idaho	5,000,000	500,000	10					250,000	April	1891	.04
36	Colorado Central, S.L.	Colo.	2,750,000	275,000	10	*				406,250	Aug.	1889	.05
37	Commonwealth, S.	Nev.	10,000,000	100,000	100	170,000	Nov.	1888	.50	20,000	Nov.	1890	.20
38	Confidence, S. L.	Nev.		24,960		328,880	May.	1890	.75	199,680	April	1889	1.00
39	Cons. Cal. & Va., S.G.	Nev.	21,600,000	216,000	100	108,000	Jan.	1885	.20	3,466,800	April	1890	.25
40	Contention, S.	Ariz.	12,500,000	250,000	50					†2,587,500	Dec.	1884	.25
41	**Cop. Queen Con., C	Ariz.	1,400,000	140,000	10					210,000	Feb.	1889	.50
42	Cortez, S.	Nev.	1,500,000	300,000	05	*				481,000	Feb.	1891	.46
43	Crescent, S. L. G	Utah.	15,000,000	600,000	25	*				228,000	Oct.	1888	.03
44	Crown Point, G. S.	Nev.	10,000,000	100,000	100	2,425,000	Sept.	1889	.50	11,588,000	Jan.	1875	2.00
45	Cumberland, L. S.	Mont.	5,000,000	500,000	10	*				15,000	Nov.	1889	.03
46	Daly, S. L.	Utah.	3,000,000	150,000	20					1,912,500	April	1891	.25
47	Deer Creek, S. G.	Idaho	1,000,000	200,000	5	*				20,000	June	1889	.05
48	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*				§1,000,000	Nov.	1887	.10
49	Derbec B. Grav., G.	Cal.	10,000,000	100,000	100	90,000	Dec.	1881	.10	240,300	Oct.	1890	.10
50	Dunkin, S. L.	Colo.	5,000,000	200,000	25	*				390,000	Oct.	1889	.05
51	Dunstone, G. S. L.	Mont.	1,000,000	200,000	5	*				6,000	Nov.	1888	.03
52	Eclipse, L. S.	Colo.	100,000	100,000	1					20,000	Nov.	1887	.10
53	Elkhorn, S. L.	Mont.	1,000,000	200,000	5	*				¶296,875	Dec.	1891	.50
54	Empire Lt., G.	Mont.	500,000	100,000	5					70,500	Oct.	1887	.37½
55	Enterprise, S.	Colo.	100,000	10,000	10	*				40,000	May.	1888	1.00
56	Eureka Con., S. L. G.	Nev.	5,000,000	50,000	100	550,000	June	1889	.50	4,892,500	Oct.	1890	.25
57	Evening Star, S. L.	Colo.	500,000	50,000	10	*				1,450,000	Dec.	1889	.25
58	Father de Smet, G.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
59	Franklin, C.	Mich.	1,000,000	40,000	25	220,000	June	1871		960,000	Jan.	1890	2.00
60	Freeland, S. G.	Colo.	5,000,000	200,000	25	*				190,000	July.	1886	.10
61	Garfield Lt., G. S.	Nev.	500,000	100,000	5					90,000	April	1888	.12½
62	Gould & Curry, S. G.	Nev.	10,800,000	108,000	100	3,988,800	Sept.	1890	.25	3,826,800	Oct.	1870	10.00
63	Grand Prize, S.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	.30	495,000	Mar.	1884	.25
64	Granite, S. L.	Idaho	500,000	500,000	1	*				28,400	Oct.	1889	.02
65	Granite Mountain, S.	Mont.	10,000,000	400,000	25					10,800,000	April	1891	.25
66	Green Mountain, G.	Cal.	1,250,000	125,000	10	*				212,000	Nov.	1881	.07½
67	Hale & Norcross, G. S.	Nev.	11,200,000	112,000	100	5,142,800	April	1890	.50	1,822,000	Aug.	1888	.50
68	Hecla Con., S. G. L. C.	Mont.	1,500,000	30,000	50					1,605,000	Mar.	1891	.50
69	Hel'a Mg. & Red, S.L.G.	Mont.	3,315,000	663,000	5	*				197,979	July.	1886	.06
70	Holmes, S.	Nev.	10,000,000	100,000	100	370,000	May.	1890	.25	75,000	April	1886	.25
71	Homestake, G.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00	4,668,750	Mar.	1891	.10
72	Honorine, S. L.	Utah.	500,000	250,000	2	37,500	April	1889	.05	125,000	Sept.	1887	.05
73	Hope, S.	Mont.	1,000,000	100,000	10	*				233,252	April	1888	.25
74	Horn-Silver, S. L.	Utah.	10,000,000	400,000	25	*				4,250,000	Mar.	1891	.50
75	Hubert, G.	Colo.	1,000,000	1,000,000	1	*				247,000	Dec.	1889	.00½
76	Idaho, G.	Cal.	310,000	3,100	100					5,285,155	Mar.	1891	2.50
77	Illinois, S.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
78	Iron Hill, S.	Dak.	2,500,000	250,000	10	134,000	July.	1889	.03	156,250	Nov.	1887	.07½
79	Iron Mountain, S.	Mont.	500,000	500,000	1	*				120,000	Feb.	1891	.05
80	Iron-Silver, S. L.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
81	Jackson, G. S.	Nev.	5,000,000	50,000	100	237,500	Nov.	1890	.20	60,000	Jan.	1891	.10
82	Jay Gould, G. S.	Mont.	2,000,000	40,000	5	*				459,000	May.	1890	.04
83	Kearsarge, C.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
84	Kentuck, S. G.	Nev.	3,000,000	30,000	100	417,430	Dec.	1890	.35	1,350,000	Dec.	1886	.10
85	La Plata, S. L.	Colo.	2,000,000	200,000	10	*				610,000	Sept.	1882	.30
86	Leadville Con., S. L.	Colo.	4,000,000	400,000	10	*				423,000	April	1887	.05
87	Lexington, G. S.	Mont.	4,000,000	40,000	100	*				565,000	Jan.	1885	2.00
88	Little Chief, S. L.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
89	Little Rule, S.	Colo.	500,000	500,000	1					130,000	Mar.	1891	.02
90	Mammoth, S. L. C.	Utah.	10,000,000	400,000	250	110,000		1882	.25	880,000	April	1891	.10
91	Martin White, S.	Nev.	10,000,000	100,000	100	1,225,000	Oct.	1890	.25	140,000	Dec.	1886	.25
92	Mary Murphy, S. G.	Colo.	350,000	3,500	101	*				175,000	May.	1888	5.00
93	Matchless, S. L.	Colo.	500,000	500,000	1	*				15,000	Feb.	1890	.00½
94	May Mazeppa, S. L.	Colo.	1,000,000	100,000	1					107,500	Mar.	1891	.01¼
95	Minas Prietas, G. S.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
96	Minnesota, C.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
97	Mollie Gibson, S.	Colo.	5,000,000	1,000,000	5	*				100,000	April	1891	.05
98	Monitor, G.	S.Dak	2,500,000	250,000	10					45,000	Oct.	1890	.03
99	Mono, G.	Cal.	5,000,000	50,000	100	760,000	Sept.	1890	.25	12,500	Mar.	1886	.25
100	Montana, Lt., G. S.	Mont.	3,300,000	660,000	5	*				2,579,475	April	1891	.12½
101	Morning Star, S. L.	Colo.	1,000,000	100,000	10					900,000	Feb.	1891	.25
102	Moulton, S. G.	Mont.	2,000,000	400,000	5	*				380,000	Dec.	1887	.07½
103	Mount Pleasant, G.	Cal.	150,000	150,000	1	*				150,000	Feb.	1887	.30
104	Mt. Diablo, S.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	180,000	Sept.	1890	.40
105	Napa, Q.	Cal.	700,000	100,000	7					410,000	April	1891	.10
106	Navajo, G. S.	Nev.	10,000,000	100,000	100	500,000	April	1890	.15	229,950	April	1889	.10
107	New California, G.	Colo.	800,000	160,000	5	*				48,800	May.	1890	12½
108	New Guston, S.	Colo.	550,000	110,000	5					785,000	April	1891	1.00
109	N. Hoover Hill, G. S.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06½
110	Northern Belle, S.	Nev.	5,000,000	50,000	100	425,000	Jan.	1884	8.00	2,400,000	April	1883	.50
111	North Belle Isle, S.	Nev.	10,000,000	100,000	100	395,000	April	1890	.20	230,000	May.	1888	.50
112	North Star, G.	Cal.	1,000,000	100,000	10					360,000	April	1889	.50
113	Ontario, S. L.	Utah.	15,000,000	150,000	100					11,825,000	April	1891	.50
114	Ophir, G. S.	Nev.	10,000,000	100,000	100	4,210,640	April	1890	.50	1,595,800	Jan.	1880	1.00
115	Original, S. C.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
116	Oro, S. L. G.	Colo.	500,000	100,000	5					95,000	July.	1890	.20
117	Osceola, C.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,497,500	April	1891	1.00
118	Parrot, C.	Mont.	1,800,000	180,000	10					804,000	Mar.	1891	.10
119	Peacock, S. G. C.	N. M.	2,000,000	200,000	10	*				60,000	Nov.	1886	
120	Plumas Eureka, G.	Cal.	1,406,250	140,625	10					2,548,000	Oct.	1889	.37½
121	Plymouth Con., G.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
122	Quicksilver, pref., Q.	Cal.	4,300,000	43,000	100					1,770,161	Jan.	1891	1.50
123	" com., Q.	Cal.	5,700,000	57,000	100					643,867	July.	1882	.40
124	Quincy, C.	Mich.	1,000,000	40,000	25	200,000	Dec.	1862		5,770,000	Feb.	1891	5.00
125	Reed National, S. G.	Colo.	500,000	500,000	1	*				40,000	Dec.	1890	.01
126	Rialto, G.	Colo.	300,000	300,000	1	*				3,000	April	1891	.01
127	Richmond, S. L.	Nev.	1,350,000	54,000	25	*				4,332,887	Jan.	1891	.62½
128	Ridge, C.	Mich.	500,000	20,000	25	219,939	Mar.	1886	.50	99,785	Feb.	1880	.50
129	Robinson Con., S. L.	Colo.	10,000,000	200,000	50	*				585,000	Mar.	1886	.05
130	Running Lode, G.	Colo.	1,000,000	1,000,000	1	*				10,000	April	1891	.00½
131	Savage, S.	Nev.	11,200,000	112,000	100	6,604,000	Nov.	1889	.50	4,460,000	June	1869	3.00
132	Sheridan, S. G.	Colo.	300,000	3,000	100	*				225,000	Dec.	1890	3.33⅓
133	Shoshone, G.	Idaho	150,000	150,000	1					7,500	April	1883	.01
134	Sierra Buttes, G	Cal.	2,225,000	122,500	10					1,492,557	April	1888	.12½
135	Sierra Nevada, S. G.	Nev.	10,000,000	100,000	100	6,296,910	May.	1890	.50	102,000	Jan.	1871	1.00
136	Sierra Nevada, S. L.	Idaho	1,000,000	1,000,000	1	*				40,000	May.	1889	.02
137	Silver Cord, S. L. G.	Colo.	4,500,000	450,000	10					225,000	Nov.	1883	.25
138	Silver King, S.	Ariz.	10,000,000	100,000	100	130,000	Nov.	1890	.30	1,950,000	July.	1887	.25
139	Silver Mg. of L.V., S.L.	N. M.	500,000	500,000	1					350,000	Feb.	1891	.10
140	Small Hopes Con., S.	Colo.	5,000,000	250,000	20	*				3,162,500	Oct.	1890	.10
141	Spring Valley, G.	Cal.	200,000	200,000	1	50,000	Oct.	1886	.25	50,000	Jan.	1881	.25
142	Standard, G. S.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,595,000	June	1888	.05
143	Stormont, S.	Utah.	500,000	500,000	1	*				155,000	Nov.	1881	.05
144	St. Joseph, L.	Mo.	1,500,000	150,000	10	*				1,974,000	Dec.	1890	.02
145	Tamarack, C.	Mich.	1,250,000	50,000	25	520,000	April	1885	3.00	1,890,000	May.	1891	4.00
146	Tombstone, G. S. L.	Ariz.	12,500,000	500,000	25	‡				1,250,000	April	1882	.10
147	United Verde, C.	Ariz.	3,000,000	300,000	10	*				127,500	May.	1890	.10
148	Viola Lt., S. L.	Idaho	750,000	150,000	5					337,500	Nov.	1888	.37½
149	Ward Con., S.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
150	Woodside, S. L.	Utah.	100,000	100,000	10					25,000	Oct.	1889	.25
151	Yankee Girl, S.	Colo.	2,500,000	250,000	10					1,405,000	April	1891	.50
152	Yellow Jacket, G. S.	Nev.	12,000,000	120,000	100	5,508,000	Mar.	1889	.50	2,184,000	Aug.	1871	2.50
153	Young America, G.	Cal.								175,000	Jan.	1889	.10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Date and am't of last.		
1	Allegheny, S.	Colo.	$5,000,000	$500,000	$10	*			
2	Alliance, S. G.	Utah.	100,000	100,000	1	$120,000	Feb.	1891	.20
3	Allouez, C.	Mich.	2,000,000	80,000	25	737,000	Jan.	1890	.70
4	Alpha Con., G. S.	Nev.	3,000,000	30,000	100	112,500	Sept.	1890	.25
5	Alta, S.	Nev.	10,080,000	100,800	100	3,359,800	Sept.	1890	.50
6	American Flag, S.	Colo.	1,250,000	125,000	10	300,000	June	1887	
7	Amity, S.	Colo.	250,000	250,000	1				
8	Anchor S. L. G.	Utah.	3,000,000	150,000	20	410,000	June	1890	.20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5				
10	Astoria, G.	Cal.	200,000	100,000	2				
11	Barcelona, G.	Nev.	5,000,000	200,000	25	*			
12	Bechtel Con., G.	Cal.	10,000,000	100,000	100	173,500		1883	.10
13	Belmont, G.	Cal.	500,000	500,000	1	*			
14	Belmont, S.	Nev.	5,000,000	50,000	100	735,000	April	1886	.10
15	Best & Belcher, S. G.	Nev.	10,080,000	100,800	100	2,279,275	Aug.	1890	.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	Bremen, S	N. M.	5,000,000	500,000	10	*			
19	Brownlow, G.	Colo.	250,000	250,000	1				
20	Brunswick, G.	Cal.	2,000,000	400,000	5	*			
21	Buckeye, S. L.	Mont.	1,000,000	500,000	2				
22	Bullion, S. G.	Nev.	10,000,000	100,000	100	2,790,000	Dec.	1889	.25
23	Butte & Boston, C. S.	Mont.	5,000,000	200,000					.25
24	Calaveras, G.	Cal.	500,000	500,000	1	*			
25	Carisa, G.	Wy.	500,000	100,000	5	*			
26	Carupano, G. S. L. C.	Ven.	200,000	100,000	2	*			
27	Cashier, G. S.	Colo.	500,000	250,000	2	*			
28	Cherokee, G.	Cal.	1,500,000	150,000	10				
29	Chollar, S. G.	Nev.	11,200,000	112,000	100	1,540,000	Nov.	1889	.50
30	Cleveland, T.	Dak.	1,000,000	500,000	2	*			
31	Colchis, S. G.	N. M.	500,000	50,000	10				
32	Colorado Silver	Colo.	1,625,000	325,000	5				
33	Comstock Tun.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.15
34	Con. Imperial, G. S	Nev.	5,000,000	50,000	100	1,875,000	July.	1890	.05
35	Con. New York, S. G.	Nev.	5,000,000	100,000	50	70,000	Nov.	1890	.15
36	Con. Pacific, G.	Cal.	6,000,000	60,000	100	198,000	June	1890	.10
37	Con. Silver, S.	Mo.	2,500,000	250,000	10				
38	Crescent, S. L.	Colo.	3,000,000	300,000	10	*			
39	Crocker, S.	Ariz.	10,000,000	100,000	100	150,000	June	1890	.15
40	Crowell, G.	N. C.	500,000	500,000	1				
41	Dahlonega, G.	Ga.	250,000	250,000	1	*			
42	Dandy, S.	Colo.	5,000,000	500,000	10				
43	Decatur, S.	Colo.	1,500,000	300,000	5	*			
44	Denver City, S.	Colo.	5,000,000	500,000	10	*			
45	Denver Gold, G.	Colo.	300,000	60,000	5				
46	Dickens-Custer, S.	Idaho	2,100,000	420,000	5				
47	Durango, G.	Colo.	500,000	500,000	1	*			
48	Eastern Dev. Co., Lt.	N. S.	1,500,000	150,000	10	990,000	Mar.	1886	1.00
49	El Cristo, G. S.	U.S.C.	1,000,000	500,000	2				
50	El Dorado, G.	Cal.	1,000,000	250,000	4	*			
51	El Talento, G.	U.S.C.	1,000,000	500,000	2				
52	Emmons, S. L.	Colo.	2,000,000	2,000,000	1				
53	Empire, S.	Utah.	10,000,000	100,000	100				
54	Eureka Tunnel, S. L.	Nev.	10,000,000	100,000	100	*			
55	Exchequer, S. G.	Nev.	10,000,000	100,000	100	865,000	July.	1890	.25
56	Found Treasure, G. S.	Nev.	10,000,000	100,000	100	81,500	May.	1890	.25
57	Gogebic 1. Syn., I.	Wis.	5,600,000	200,000	25				
58	Gold Cup, S.	Colo.	500,000	500,000	1	*			
59	Golden Era, S.	Mont.	2,000,000	200,000	10	*			
60	Gold Rock, G.	Cal.	1,000,000	500,000	2	*			
61	Goodshaw, G.	Cal.	10,000,000	100,000	100	*			
62	Grand Belt, C.	Tex.	12,000,000	120,000	100				
63	Grand Duke	Colo.	800,000	80,000	10				
64	Great Remance, G.	U.S.C.	1,000,000	500,000	2	*			
65	Gregory Con., G.	Mont.	3,000,000	300,000	10				
66	Harlem M. & M. Co., G.	Cal.	1,000,000	200,000	5				
67	Hartery Con., G.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
68	Head Cent. & Tr., S. G.	Ariz.	10,000,000	100,000	100				
69	Hector, G.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
70	Highland, C.	Mich.	500,000	25,000	20				
71	Holywood	Cal.	200,000	100,000	2				
72	Hortense, S.	Colo.	2,000,000	200,000	10				
73	Huron, C.	Mich.	1,000,000	40,000	25	280,000	May.	1887	3.00
74	Iron, Gold & Silver, S.	N. M.	2,000,000	200,000	10	*			
75	Ironton, I.	Wis.	1,000,000	40,000	25				
76	Iroquois, C.	Mich.	1,250,000	50,000	25				
77	J. D. Reymert, S.	Ariz.	10,000,000	100,000	100				
78	Julia Con., G. S.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1889	.10
79	Lacrosse, G.	Colo.	1,000,000	100,000	10	*			
80	Lee Basin, S.	Colo.	5,000,000	500,000	10	*			
81	Madeleine, G. S. L.	Colo.	750,000	750,000	1	*			
82	Mammoth Gold, G.	Ariz.	245,000	49,000	5	*			
83	Mayflower Gravel, G.	Cal.	1,000,000	100,000	10	585,000	Mar.	1890	.56
84	Medora, G.	Dak.	250,000	250,000	1				
85	Merrimac Con., G. S.	Colo.	5,000,000	500,000	10	*			
86	Mexican, G. S.	Nev.	10,000,000	100,000	100	2,791,960	Oct.	1890	.25
87	Middle Bar, G.	Cal.	400,000	200,000	2	*			
88	Mike & Starr, S. C.	Colo.	1,000,000	200,000	5	*			
89	Milwaukee, S.	Mont.	500,000	500,000	1	12,500	May.	1891	.01
90	Monitor, G.	Colo.	100,000	1,000,000	1	*			
91	Mutual Mg. & Sm.	W'sh.	100,000	100,000	1	*			
92	Native, C.	Mich.	1,000,000	40,000	25				
93	Neath, G.	Colo.	1,000,000	100,000	10				
94	Nevada Queen, S.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
95	New Germany, G.	N. S.	100,000	100,000	1	*			
96	New Pittsburg, S. L.	Colo.	2,000,000	200,000	10	*			
97	N. Commonw'h, S.	Nev.	10,000,000	100,000	100	85,000	April	1890	.25
98	North Standard, G.	Cal.	10,000,000	100,000	100	20,000	Nov.		
99	Noonday	Cal.	600,000	60,000	10	208,000	Dec.	1881	.10
100	Oneida Chief, G.	Cal.	500,000	125,000	100	*			
101	Oriental & Miller, S.	Nev.	10,000,000	400,000	25				
102	Osceola, G.	Nev.	5,000,000	500,000	10	*			
103	Overman, G. S.	Nev.	11,520,000	115,200	100	3,832,800	Dec.	1889	.25
104	Park, S.	Utah.	2,000,000	200,000	10				
105	Peer, S.	Ariz.	10,000,000	100,000	100	165,000	Oct.	1890	.10
106	Peerless, S.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
107	Phœnix	Ariz.	500,000	500,000	1	*			
108	Phœnix Lead, S. L.	Colo.	100,000	100,000	1	*			
109	Pilgrim, G	Cal.	600,000	300,000	2	*			
110	**Pioche M.&R., S.G.L.	Utah.	20,000,000	2,000,000	10				
111	Potosi, S.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
112	Proustite, S.	Idaho	250,000	250,000	1	*			
113	Puritan, S. G	Colo.	1,500,000	150,000	10	*			
114	Quincy, C.	Colo.	3,000,000	300,000	10				
115	Rappahannock, G. S.	Va.	250,000	250,000	1	*			
116	Red Elephant, S.	Colo.	500,000	500,000	1	*			
117	Red Mountain, Ltd., S	Colo.	300,000	60,000	5	*			
118	Ropes, G. S.	Mich.	2,000,000	80,000	25	147,200	July.	1887	.50
119	Ruby & Dun., S. L. G.	Nev.	25,300	506	50	*			
120	Russell, G.	N. C.	1,500,000	300,000	5				
121	Sampson, G. S. L.	Utah.	10,000,000	100,000	100	288,157	July.	1888	1.08
122	San Sebastian, G.	San S.	1,600,000	320,000	5	*			
123	Santa Fe, C.	N. M.	5,000,000	500,000	10				
124	Santiago, G.	U.S.C.	400,000	200,000	2	*			
125	Silver Age, S. L. G.	Colo.	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	St. Kevin, S. G.	Colo.	100,000	100,000	1	*			
132	St. Louis & Mex., S.	Mex.	5,000,000	500,000	10	*			
133	St. Louis & St. Elmo.	Colo.	2,000,000	200,000	10				
134	St. L. & St. Felipe, G.S.	Mex.	1,500,000	150,000	10				
135	St. L. & Sonora, G. S.	Mex.	1,500,000	150,000	10				
136	St. Louis-Yavapai	Ariz.	3,000,000	300,000	10	*			
137	Sunday Lake, I.	Mich.	1,250,000	50,000	25				
138	Sullivan Con., G.	Dak.	600,000	200,000	3	*			
139	Sylvanite, S.	Colo.	5,000,000	500,000	10	*			
140	Taylor-Plumas, G.	Cal.	1,000,000	200,000	5	10,000	Feb.	1888	.10
141	Tioga Con., G.	Cal.	10,000,000	100,000	10	295,000	May.	1888	.25
142	Tornado Con., G. S.	Nev.	100,000	100,000	1	*			
143	Tuscarora, S.	Nev.	10,000,000	500,000	20	15,000	Oct.	1889	.10
144	Union Con., G. S.	Nev.	10,000,000	100,000	100	2,310,000	July.	1890	.25
145	Utah, S.	Nev.	10,000,000	100,000	100	245,000	Aug.	1890	.25
146	Ute & Ulay, S. L.	Colo.	500	100	5	*			
147	Whale, S.	Colo.	500,000	500,000	1				
148	Washington, C.	Mich.	1,000,000	40,000	25				
149	West Granite Mt., S.	Mont.	5,000,000	500,000	10	*			
150	Yuma, C. S. G.	Ariz.	10,000,000	400,000	25				
151	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 December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends, and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Con. Virginia 40,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ This company paid $190,000 before reorganization in 1890. **This company acquired the property of the Raymond & Ely Company, which had paid $3,075,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	May 2.		May 4.		May 5.		May 6.		May 7.		May 8.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.													
Alice, Mont.													
Argenta, Nev.													
Atlantic, Mich.													
Belcher					3.40		3.75						2 0
Belle Isle, Nev.					.75								100
Bodie Con., Cal.													
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.													
Caledonia, S. Dak.													
Calumet & Hecla													
Chrysolite, Colo.			.30										200
Colorado Central, Colo.			1.50										100
Commonwealth, Nev.													
Comstock T. bonds, Nev.					.36								1,000
" scrip., Nev.													
Cons. Cal. & Va., Nev.	17.00		17.50	17.00	18.50	18.25			19.00				758
Crown Point, Nev.					2.90						3.10	2.95	500
Deadwood, Dak.													
Eureka Cons., Nev.													
Father de Smet, S. Dak.	.49	.47					.40						1,000
Franklin, Mich.													
Freeland, Colo.	.17	.15			.17	.16	.15		.17	.15			6,700
Gould & Curry, Nev.	3.50												100
Granite Mountain, Mont.													
Hale & Norcross, Nev.													
Holyoke, Idaho			.63										100
Horn-Silver, Utah					3.75	3.70	3.75		3.80	3.70	3.80	3.75	3,000
Independence, Nev.													
Iron Hill, Dak.							.35						100
Kearsarge, Mich.													
Leadville Cons., Colo.											.12		100
Little Chief, Colo.					.36	.34			.24				1,100
Mono, Cal.													
Moulton, Mont.	.39												200
Mt. Diablo, Nev.													
Navajo, Nev.					.42		.40		.40		.49		600
N. Belle Isle, Nev.													
Ontario, Utah													
Ophir, Nev.							9.25						100
Osceola, Mich.													250
Plymouth, Cal.	2.00				2.00				2.00				
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.							.60		.60				700
Savage, Nev.	3.50				4.15								200
Sierra Nevada, Nev.					4.35								100
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Mg. of L. V., N.M.													
Small Hopes, Colo.													
Ward Cons., Colo.													
Yellow Jacket, Nev.	3.15		2.50				3.25		3.30				400

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	May 2.		May 4.		May 5.		May 6.		May 7.		May 8.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alpha, Nev.					1.25						1.35		200
Alta					1.20				1.20				500
American Flag, Colo.													
Andes, Cal.											2.60		200
Astoria, Cal.	.02		.02				.02		.02		.02		7,000
Augusta, Ga.	15.38		15.50		15.88		16.00						400
" bonds.			90.25										10,000
Belmont, Cal.	.48		.50	.48	.50		.51	.50	.51	.50	.51	.50	3,700
Barcelona, Nev.	.20	.15	.20	.18							.11		1,400
Best & Belcher, Nev.													
Bonanza King, Cal.													
Brunswick, Cal.	.10		.10		.10		.09		.10		.10	.09	3,500
Bullion, Nev.							2.60				3.00		200
Butte & Bost., Mont.													
Castle Creek, Idaho					.62								400
Col. & Beaver, Idaho													
Comstock T., Nev.	.21	.19	.20	.19	.21	.20	.23	.20	.24	.20			35,423
Con. Imperial, Nev.					.30				.33				1,600
Cons. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.	.40		.48		.60	.52	.55				.50		1,500
Exchequer, Nev.					1.10								200
Hollywood, Cal.													
Huron, Mich.													
Julia, Nev.			.31								.37		400
Justice, Nev.											1.20		100
King. & Pembroke, Ont.													
Lacrosse, Colo.													
Lee Basin, Colo.													
Mexican, Nev.													
Middle Bar, Cal.					.62		.62		.62		.62		16,500
Monitor, Colo.	.04												100
Mutual S.& M.Co., Wash.	1.40				1.45						1.35		500
Nevada Queen, Nev.													
N. Standard, Cal.							.08						100
N. Commonwealth, Nev.													
Occidental, Nev.	1.30				1.40	1.35			1.40				700
Oriental & Mil., Nev.													
Phœnix of Ariz.				.45	.46								300
Phœnix Lead, Colo.													
Potosi, Colo.													
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santa Fe, N. M.													
Scorpion, Nev.											.35		300
Seg Belcher, Nev.													
Shoshone, Idaho													
Silver Hill, Nev.													
Sullivan Con., Dak.											.35		200
Sutro Tunnel, Nev.													
Syndicate									.14				2,000
Tornado Con., Nev.													
Union Cons., Nev.	3.40		3.20										100
Utah, Nev.													

*Ex dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 17,408. Non-dividend shares sold, 87,633. Total, New York, 105,041.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	May 1.		May 2.		May 4.		May 5.		May 6.		May 7.		SALES.
Atlantic, Mich											15.50		50
Bodie, Cal.													
Bonanza Development													
Bost. & Mont., Mont.	42.00	41.50	42.00		41.50	42.50	42.00	41.00	41.50	41.25			1,134
Breece, Colo.													
Calumet & Hecla, Mich.					260				260		257	255	52
Catalpa, Colo.	.25												100
Central, Mich.													
Chrysolite, Colo.													
Con. Cal. & Va., Nev.													
Dunkin, Colo.	.65												100
Eureka, Nev.													
Franklin, Mich.					17.50		17.50		17.50	17.25			195
Honorine, Utah.													
Horn Silver, Utah													
Kearsarge, Mich.					13.50		13.00		13.50				160
Little Chief, Colo.													
Little Pittsburg, Colo.													
Moulton, Mont.													
Napa, Cal.													
Ontario, Utah													
Osceola, Mich.	36.50				36.50	36.25	36.50	35.50			35.75	35.50	583
Quincy, Mich.	106						105		105				26
Ridge, Mich.													
Sierra Nevada, Nev.													
Silver King, Ariz.													
Stormont, Utah													
Tamarack, Mich.	150		150						150		150		74
Tecumseh, Mich.													

NAME OF COMPANY.	May 1.		May 2.		May 4.		May 5.		May 6.		May 7.		SALES
Allouez, Mich.	3.25		3.25										15
Arnold, Mich.	.75												100
Aztec, Mich.													
Brunswick, Cal.													
Butte & Boston, Mont.		.25			16.50		16.00		16.00		16.00	15.75	595
Centennial, Mich.	15.50	15.25									15.50		150
Comstock, T., Nev.													
Copper Falls, Mich.													
Crescent, Colo.													
Dana, Mich.													
Don Enrique, N. M.													
El Cristo, S. A.													
Hanover, Mich.													
Humboldt, Mich.													
Hungarian, Mich.													
Huron, Mich.													
Mesnard, Mich.													
National, Mich.											3.00		200
Native, Mich.													
Oriental & M., Nev.													
Phœnix, Ariz.													
Pontiac, Mich.													
Rappahannock, Va.													
Santa Fe, N. Mex.				.65	.58				.50				2,725
Shoshone, Idaho													
South Side, Mich.													
Star, Mich.													
Washington, Mich.													
Winthrop, Mich.													

Boston: Dividend shares sold, 2,474. Non-dividend shares sold, 3,785. Total Boston, 6,259.

COAL STOCKS.

NAME OF COMPANY.	Par val. of shares.	May 2.		May 4.		May 5.		May 6.		May 7.		May 8.		Sales.
		H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal														
Cambria Iron														
Cameron Coal & I. Co														
Ches. & O. RR	100													
Chic. & Ind. Coal RR	100													
Do. pref	100													
Col. C. & I.	100	39	38¾	38½	38	38⅝		38¼	37¾	38	37½	37¾	3 ¾	3,200
Col. & Hocking C. I.	100													
Consolidation Coal.	100													
Del. & H. C.	100	136¼	135⅝			136¼		134¼		134⅞		134¾	133¾	461
D., L. & W. RR.	50	139⅝	138⅞	139⅛	138½	139⅛	137½	138⅜	137½	138¼	137¼	137½	136½	31,220
Hocking Valley	100	28		27⅞	27¼	28¼	27⅝	29½	28	29⅜	27⅝	28¼	27	8,818
Hunt. & Broad Top.		23½		24	23¾	24	23½	24		24				1,785
Do. pref.				46¾	46½	46¾		46⅞		47				1,159
Illinois C. & Coke Co														
Lehigh C. & N.	50	47½	47⅜	47⅜	47¼	47¼	47⅛	47		47				798
Lehigh Valley RR	50	48⅝	48½	48⅝	48½	48⅝	48½	48½	48¼	48⅝	48¼			1,276
Lehigh & Wilk. Coal	100													
Mahoning Coal.	100													
Do. pref.	100													
Maryland Coal.						18½	17⅝					18¼	18	650
Morris & Essex.	100	147½	147			147½		148	147⅝	148¼				512
New Central Coal.	50					10¾								200
N. J. C. RR.	100	120½	119¾	120¼	119½	119¼	118¾	120¼	119¾	120	118¾	118¾	117¾	5,442
N. Y. & S. Coal	100													
N. Y., Susq. & West	100			8⅝								8		500
Do. pref	100	32⅞	32					31		31		31		80
N. Y. & Perry C. & I	100													
Norfolk & West. RR.	50							16				16¼	16	220
Do. pref	50	56¾		55⅝	55¼			54¾		54¾	54⅝	54		1,005
Penn. Coal	50					260						290		48
Penn. RR.	50	51¾	51½	51⅝	51	51	50	50¼	50¼	50½	50¼			8,784
Ph. & R. RR.		34⅛		34	33¾	34	33½	33⅝	33	33⅝	33½	33	32½	**16,489
Sunday Creek Coal.														
Do. pref.	100													
Tennessee C. & I. Co.				35¾	35½	35⅞	35¼	35½		36	35⅝	35¼	32½	6,900
Do. pref.		87				87						87		300
Westmoreland Coal.														

**Sales in New York, 4,149; in Philadelphia 12,340. Total sales, 90,567.

San Francisco Mining Stock Quotations.

COMPANY.	CLOSING QUOTATIONS.					
	May 1.	May 2.	May 4.	May 5.	May 6.	May 7.
Alpha.						
Alta.	1.10	1.15	1.10	1.15	1.25	1.15
Belcher		.85	.60	.70	.70	
Belle Isle.		.85	.60	.70	.70	
Best & Bel.	8.75	9.00	9.25	8.75	8.50	8.50
Bodie.	1.15	1.25	1.10	1.25	1.30	1.30
Bulwer.	.35	.35	.35	.35	.30	.30
Challar.	2.90	2.80	2.85	2.95	3.50	3.50
Com'wealth	.90	.80	.85	.85	.90	.90
Con. C. & V.	13.37½	13.37½		19.87½	19.87½	17.75
Con. Pacific.						
Crown Point.	2.70	2.87	2.75	2.80	2.90	2.85
Del M'te, Nev.						
Eureka C.				4.00		
Gould & C.	3.75	3.70	3.90	4.00	3.98	3.70
Hale & N.	3.45	3.55	3.75	3.90	4.15	3.70
M. White.						
Mexican.	4.75	4.85	5.12½	5.12½	5.12½	4.85
Mono.	.60	.60	.60	.65	.60	.60
Mt. Diablo.						
Navajo.	.53	.30	.30	.35	.30	.35
Nev. Queen.	.50	.45	.40	.55	.45	.45
N. Belle Isle.	.85	.85		.80	.75	.80
N. Com'w'lth.				.85	.90	
Ophir.	8.75	9.12½	9.37½	8.87½	9.00	8.62½
Potosi.	4.50	4.35	4.40	4.45	5.25	4.55
Savage.	3.45	3.40	3.35	3.75	3.90	3.70
Sierra Nev.	3.80	3.75	4.10	4.25	4.15	3.80
Union Con.	4.35	4.35	4.75	4.75	4.85	4.60
Utah.	1.20	1.30	1.45	1.25	1.40	1.35
Yellow Jack.	2.95	2.90	2.90	3.00	3.15	3.05

STOCK MARKET QUOTATIONS.

Baltimore, Md.

COMPANY.	Bid. L.	Asked. H.
Atlantic Coal	$1.10@1.15	$1.25
Balt. & N. C.	.06	.1
Big Vein Coal	....	1.10
Conrad Hill	....	.10
Cons. Coal	.24	....
Diamond Tunnel	....	....
George's Crk. C.	....	1.15
Lake Ubrome	.10	.15
Maryland & Charlotte	...	...
North State	....	....
Silver Valley	.65@.71	.66@.68

Prices bid and asked, lowest and highest, during the week ending May 7.

Birmingham, Ala.

COMPANY.	May 6. Bid. L. H.	Asked L. H.
Ala. Coal & I. Co.	....	$100
Ala. Conn. C. & C. Co.	....	$23
Ala. R. Mill Co.	$100	....
*Alice Furnace	$100	....
Anna Howe G. Mg. Co.	$¼	$½
Bessemer Land	$29	$30
Bir. Mg. & Mfg.	....	$35
Cahaba Coal Mg. Co.	...	$61
Camille Gold Mg. Co.	$½	$¾
De Bardeleben C. & I. Co.	$8½	$9¼
Decat. L. Imp.	$8¾	$9¼
Decatur Min. L.	....	$19
Ensley Land	$7½	$9
*Eureka	....	....
Florence L. & Mg. Co.	....	$18¼
Gadsen Land	$3⅜	$3⅞
Hecla Coal Co.	....	....
Hen. S. & M. Co.	$2¾	$4¼
Jagger-Townl'y C. & C. Co.	$8½	$10
Mag-Ellen	$100	....
Mary Lee C. & R. Co.	....	$25
Sheffield C. & I. Co.	$52½	$55
Sloss I. & S.	$18½	$21
†Sloss I. & S.	$85	$87
‡‡ Sloss I. & S.	$49	$52½
Tuscaloose C. I. & L. Co.	....	$24
Ten. C. & I. Co.	$32½	$35
" pref.	$86	$88
Vulcan C. & C. Co.	$5	$7½
Woodstock I. Co.	$28	$29

* Bonds. † First mortgage. ‡‡ Second mortgage. ** Without interest.

Pittsburg, Pa.

COMPANY.	May 7. B.	A.	Closing.
Allegheny Gas Co.	$.....	$.....	$.....
Bridgewater Gas Co.	45.00	48.00	45.00
Chartiers Val. Gas	7.00	10.00	10.00
Columbia Oil Co.	1.00	3.00	1.00
Consignee Mg. Co.	.20	.50	.20
Consolidated Gas Co.	40.00	.....	40.00
East End E. Light Co.	.....	.....	.....
East End Gas Co	.....	.....	.....
Forest Oil	.....	.....	.....
Hazlewood Oil Co.	.....	.....	.....
La Noria Mining	.30	.40	.35
Luster Mg. Co.	12.25	13.00	12.88
Manstield C. & C. Co.	.....	.....	.....
Manuf'turers Gas Co.	23.50	25.00	24.00
Nat. Gas Co. of W. Va	57.50	60.00	60.00
N.Y.& Clev. Gas Coal.	37.00	40.00	40.00
Ohio Valley Gas.	20.63	22.00	22.00
Pennsylvania Gas	.....	11.00	11.00
People's Natural Gas.	.....	30.00	30.00
People's N. G. & P. Co.	9.00	9.38	9.00
Philadelphia Co.	12.88	13.00	13.00
Pine Run Gas Co.	.....	...	....
Pittsburg Gas	70.00	.....	70.00
Silverton Mg. Co.	1.75	2.00	2.00
Sterling Silver Mg. Co.	4.00	5.00	4.00
Soutb Side Gas.	.....	.....	.....
Tuna Oil Co.	55 00	60.00	60.00
Union Gas.	.....	.....	.....
Washington Oil Co.	80.00	85.00	80.00
W'house Brake Co	.....	.....	.....
W'house A. B. Co.	90.50	92.00	91.75
W'nouse E. Light.	11.75	14.88	14.75
W'moreland & Camb.	.....	.....	.....
Wheeling Gas.	15.50	17.00	16.00
Yankee Girl Mg	.....	.....	.....

St. Louis.

CLOSING PRICES.

COMPANY.	May 6. H.	L.
Adams, Colo.	$1.90	$1.77½
American & Nettie.	.25	.23¾
Aztec, N.Mex.	.17½	.12½
Bi-Metallic.	33.50	33.00
Central Silver.	.02½	.02
Cleveland, Colo.	.....	.....
Elizabetb	2.40	2.32½
Gold King	.05	.05
Granite Mountain, Mont.	26.25	26.00
Hope	.....	.....
Ingram	.....	.....
I. X. L., Colo.	.....	.....
La Union	.....	.....
Little Albert	.11	.10½
Montrose Placer, Colo.	.63¾	.61¼
Major Budd, Mont.	.....	.....
Mexican Imp	.....	.....
Mickey Breen.	1.10	1.05
Mountain Key	.50	.47½
Nellie	.....	.....
Old Colony	.....	.....
Pat Murphy, Colo.	.....	.....
Puzzle	.....	.....
Richmond Hill	.....	...
Samoa	.....	.....
Silver Age, Colo.	2.50	2 20
Small Hopes, Colo.	.87½	.85
Tourtelotte	.....	.....
West Granite, Mont.	.....	.....
Wire Patch	.85	.80
Yuma, Ariz.	.77½	.....

Trust Receipts.

Sales at the New York Stock Exchange week ending May 8:

	Sales.	Price H.	Price L.
*American Cotton Oil	1,700	26¾	25
National Lead	12,334	19¾	18⅞

*Trust receipts.

Trust Stocks.

May 8.

The following closing quotations are reported to-day by C. I. Hudson & Co., members of New York Stock Exchange:

CERTIFICATES.

Am. Cotton Oil. Com	$26	@26¾
" " " Pfd	47¼	@ 48¼
" " " Tr. Rcpts	24¾	@ 25
Am. Sugar Refineries, Com.	86	@ 87
" " " Pfd	92¼	@ 92¾
Distillers' & Cattle Feeders'	45	@ 45½
Linseed Oil	39	@ 40
Standard Oil	163	@167
National Lead	18⅞	@ 19
W. U. Beef Co.	10	@ 15

Foreign Quotations.

London. April 21.

COMPANY.	Highest.	Lowest.
Almada, Mex.	£3-16	£1-16
Amador, Cal.	7s. 6d.	6s. 6d.
Appalachian, N. C.	6d.	3d.
Canadian Phos., Can.	£½	£¼
Colorado, Colo.	3s. 6d.	2s.
Comstock, Utah.	....	..
Cordova	....	..
Cons. Esmeralda, Nev.	2s. 6d.	2s.
Denver Gold, Colo.	6d.	..
Dickens Custer, Idaho.	2s.	1s. 6d.
East Arevalo, Idaho.	2s.	1s.
El Callao, Venezuela.	....	....
Elmore, Idabo.	1s. 9d.	1s. 3d.
Garfield, Nev	1s.	3d.
Jay Hawk, Mont.	3s.	2s. 6d.
Josephine, Cal.	1s.	6d.
Kohinoor, Colo.	1s. 3d.	9d.
La Luz, Mex.	1s. 6d.	1s.
La Valera, Mex.	£1¼	£⅝
Montana Lt., Mont.	14s.	13s.
New California, Colo.	5s. 2d.	4s. 9d.
New Consolidated	5d.	3d.
New Eberhardt, Nev.	1s. 6d.	1s.
New Emma, S., Utah.	3s. 9d.	3s. 3d.
Newfoundland, N. F.	3s 6d.	3s.
N. Gold Hill, N. C.	2s.	1s. 6d.
New Guston, Colo.	£3¾	£3¼
New Hoover Hill, N.C.	2s. 6d.	....
Old Lout, Colo	....	....
Palmarejo, Mex.	13s. 6d.	12s. 6d.
Pinos Altos, Mex.	7s. 6d.	6s. 6d.
Pittsburg Cons., Nev.	7s.	6s. 6d.
Richmond Con, Nev.	£1⅛	£⅞
Ruby&Dunderb'g. Nev.	1s. 6d.	1s.
Sam Christian, N. C.	1s. 3d.	9d.
Sierra Buttes, Cal.	5s.	4s.
" Plumas E. r., Cal.	£9-16	£7-16
Sonora, Mex.	....	....
United Mexican, Mex.	5s.	4s.
U. S. Placer, Colo.	6d.	....
Viola Lt., Idaho	1s. 3d.	9d.
Yankee Girl, Colo.	£9-16	£7-16

Paris. April 23.

COMPANY.	Francs.
Belmez, Spain	815.00
Callao, Venez	37.50
Callao Bis., Venez	14.00
East Oregon, Ore	3.50
Forest Hill Divide, Cal	85.00
Golden River, Cal	130.00
" " parts	30.00
Lexington, Mont	97.50
" parts	2 75
Rio Tinto, Spain	597.00
Tharsis, Spain	170.00

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Acid—Acetic, No. 8, pure, 1,040, ℔ lb.. .08
in bbls. and cbys. .06
Carbonic, liquefied .40
Chromic, ch pure .$1.00
for batteries .50
Hydrobromic, dilute, U. S. P. .35
Hydrocyanic, U. S. P. .55
Hydrofluoric .30
Alcohol—95%, ℔ gall. 2.10
Absolute 4.00
Ammoniated 3.60
Alum—Lump, ℔ lb 1¾
Ground, ℔ lb. 2
Powdered 4¾
Lump ℔ ton, Liverpool £4 17 6
Sulphate of Alumina, ℔ ton £1 10
Alumina Chloride—Pure, ℔ lb.. 1.25
Sulphate, commercial 1¾
pure 2¾
Amalgamating solution, ℔ lb. .60
Ammonia—Sul., in bbls., ℔ lb. .04
Carb, ℔ lb. .14
Muriate, white, in bbls., ℔ lb. .08½
Ammoniates—Kieserite 6 00@ 650
Fish guano, dried 19 50@20 00
acidulated 9 00@10 00
wet 8 50@ 9 50
Acid phosphate, 14% per unit. 72½@ 80
Aqua Ammonia—(in chys) 18°℔ lb. 4½@6
20°, ℔ lb. 6@7
22°, ℔ lb. 6@7
26°, ℔ lb. 10@11
Antimony—Oxymur, ℔ lb. 4¾
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. .3@3¼
Red ℔ lb. .5@5½
White at Plymouth, ℔ ton £12 2 6
Asbestos—Am., ℔ ton $50@$300
Italian, ℔ ton, c. i. f. L'pool £18@£20
Ashes—Pot, 1st sorts, ℔ lb. 4¾@4¾
Pearl 6¼@6½
Asphaltum—P. ton 13.00
Prime Cuban, ℔ lb. 4½@5½c.
Hard Cuban, P ton $28.00
Trinidad, refined, ℔ ton $30.00
Egyptian 8@9
Baryta—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb. .10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, powdered, ℔ lb. .15
Sulphate, ℔ lb. .05
Barytes—Sulph., Am. prime white 17@20
Sulph., foreign, floated, ℔ ton 19½@21.50
Sulph., off color, ℔ ton 11.50@14.00
Carb., lump, f. o. b. L'pool, ton £6
No. 1, Casks, Runcorn, " £4 10 0
No. 2, bags, Runcorn, " 3 15 0
Beeswax—Refined, ℔ lb. .40
Benzole—℔ gall. .50
Bichromate of Potash—scotch 10@12
American 10@12
Bichromate of Soda 8½@11½
Borax—Refined, ℔ lb. 11
Concentrated 8¼@8½
Refined " Liverpool ℔ ton £29
Bromine—℔ lb. .55
Cadmium Bromide—℔ lb. 2.00
Iodide, ℔ lb. 5.50
Chalk—℔ ton 1.75
Precipitated, ℔ lb. 4¾@5
China Clay—English, ℔ ton 13½@21.00
Southern, ℔ ton 13.50
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. 10@25
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lb. 1.12
Cobalt—Oxide, ℔ lb. 2.50@2.90
Copper—Sulph. English Wks. ton £20@£21
Nitrate, ℔ lb. .10
Copperas—Common, ℔ 100 lbs. .70
Best, ℔ 100 lbs. 75@1.00
Liverpool, ℔ ton, in casks £1 15s.
Corundum—Powdered, ℔ lb. 4½@.9
Flour, ℔ lb. .3
Cream of Tartar—Am. 90% 24½
Powdered, 99 p. c. 25
Cryolite—Powdered, ℔ lb. .12
Emery—Grain, ℔ lb. (℔ kg.) 4½@5
Flour, ℔ lb. 2½@10
Epsom salt—℔ lb. .4
in lbs. .1½
Feldspar—Ground, ℔ ton 20.00
Flint—Pure, ℔ ton 20.00
Fluorspar—Powdered, No. 1, ℔ ton. 30 00
Fuller's Earth—Lump, ℔ bbl.. 90@95
Powdered, ℔ lb. 1¾@2
Fusel Oil—℔ gall. .60
Purified, ℔ gall. .75
Gelatine—Cox's, doz 2.00
Coignet's Gold Label, ℔ lb. 1.00
Silver Label, ℔ lb. .88
Heinrich's Gold Label, ℔ lb. .75
for emulsion, ℔ lb. 1.00
Nelson s No. 1, ℔ lb. 1.10
No. 1, Shreds, ℔ lb. 1 25
No. 3, ℔ lb. .75
Glauber's Salt—in bbls, ℔ lb. ¾
Glass—Ground, ℔ lb. .10
Glue—Brown, ℔ lb. .20
White, ℔ lb. .30
Glycerine—Concent. ch. pure, ℔ lb. 25
Gold—Chloride, pure, crystals, ℔ oz. 12.00
pure, 15 gr., c. v., ℔ doz. 5 40
liquid, 15 gr., g. s. v., ℔ doz. 5.50
Chloride and sodium, ℔ oz 6.00
15 gr., c. v., ℔ doz. 2.88
Oxide, ℔ oz. 27.25
Gum—Arabic, picked, ℔ lb. .50
Benzoe, ℔ lb. .60
Damar, ℔ lb. .30
Elemi, ℔ lb. .30
Mastic, ℔ lb. 1.25
Sandarac, ℔ lb. .40
Shellac, brown, ℔ lb. .35
refined, ℔ lb. .50
Thus, ℔ lb. .10
Gypsum—Calcined, ℔ bbl. 1.25@1.50
Iodine—Resublimed 2.75
Iron—Nitrate, 40°, ℔ lb. 1½
47°, ℔ lb. 2½
Kaolin—*See China Clay.*
Lead—Red, ℔ lb. 6¾@9
White, American, in oil, ℔ lb. 6½@7¼
White, English, ℔ lb. 8½@8¾
Acetate, or sugar of, white. 12@13
Nitrate 9@10
Lime Acetate—Amer. Brown 1 10@1.20
" Gray 2.00@2.15
Litharge—Powdered, ℔ lb. 6½@7¼
English flake, ℔ lb. 9@9½
Magnesite—Greek, ℔ ton 20.00
Manganese—Crude, per unit. 23@28
Oxide, ground, per lb. 2½@6½
Marble Dust—℔ bbl 1.25
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .89
Powdered, ℔ lb. .99
Metallic Paint—Brown per ton. $20@25
Red $20@25
Mineral Wool—℔ lb 2
Mica—In sheets according to size.
1st quality, ℔ lb. 25@$6.00
Naphtha—Black 60
Nitre Cake—℔ ton 8.00
Ochre—Yellow, "B. F.," ℔ ton, f. o. b. mill 30.00
"J. F. L. S.," ℔ lb. ex dock 2½
Yellow 10@25
Rochelle 1.35@1.50
Washed Dutch 5@—
Washed French 1½@1⅝
Washed Nat Oxford, Lump 6½@6¾
Washed Nat Oxford, Powder 7@7½
Golden 3¾@4
Domestic ¾@1½
Domestic, for O. C. & W. P. ¾@1
Oils, Mineral
Cylinder, light filtered 15@20
Dark filtered 11@15
Extra cold test 18@20
Dark steam refined 10@18
Phosphorus—℔ lb. 64@65
Precip., red 100@102
white 100@103
Plumbago—Ceylon, ℔ lb. 4@5
American, ℔ lb. 5@7
Potassium—Cyanide, ℔ lb., C. P. .72
Special .50
Fused .45
Bromide, ℔ lb. .33
Chlorate, English, ℔ lb 11@14
Chlorate, powdered 13@14
Carb, ℔ lb 4.70@5.54
Caustic, ℔ lb. 7½@8
Iodide 2,65@2.70
Muriate, ℔ 100 lbs. 2.50
Nitrate, refined, ℔ lb. 6@8
Bichromate, ℔ lb 10½@11
Dble. m'ure salt, basis of 4% 50%. 1.07½
Sulphate, basis of 90% ℔ 100 lbs. 3.00
Yellow Prussiate 32½@35
Red Prussiate 42@45
Pumice Stone—Select lumps, lb. 3¼
Original cks., ℔ lb 1¾@2
Powdered, pure, ℔ lb. 2 @2¾
Pyrites—Non-cupreous, p. units 10d.
Quartz—Ground, ℔ ton 14.00@16.00
Rotten Stone—Powdered, ℔ lb. 3¼@3½
Lump, ℔ lb. 6@10
Original cks. 4½@5½
Rubbing stone 7
Sal Ammoniac—in bbls., ℔ lb. 10¼
Salt—Liverpool, ground, ℔ sack 75@80
Turk's Island, ℔ bnsh 25@28
Salt Cake—℔ ton 8 00
Saltpeter—Crude, ℔ lb. 3¾@4¾
Refined, ℔ lb. 6@8
Silex, ℔ ton 14@25
Soda—Nitrate 1.80@1.85
Prussiate 17½@18
Phosphate 7@18
Stannate 8@15
Strontium—Nitrate, ℔ lb. 9½@10
Sylvinit, 23@27%, S. F. P., per unit. 40@42½
Talc—Ground French, ℔ lb. 1¼@1½
Domestic, ℔ ton $18@$20
c. i. f. Liverpool, ℔ ton £4 5
Terra Alba—French 90@1.00
English 75@80
American, No. 1 —@—
American, No. 2 40@50
Tin—Crystals, in kegs or bbls. 16¼
feathered or flossed. 25
Muriate, single 7
Double or strong, 51° B. 9
Oxy. or nitro. 10
Bar. 25
Vermillion—Imp. English .90 @ .95
Am. quicksilver, bulk .67 @—
Am. quicksilver, bags .68 @ .71
Chinese .95 @1.00
Trieste .90 @ .95
American 11½@ .12
Artificial 8 @ .35
Vitriol—(Blue), Ordinary, ℔ lb. 1 @4½
Extra, ℔ lb. 4½@4¾
Zinc Oxide—Am., Dry, ℔ lb. 4½
Antwerp, Red Seal, ℔ lb. 6@6½
Paris, Red Seal, ℔ lb 6½@7
Muriate solution, ℔ lb 1
Sulphate crystals, in bbls., ℔ lb. 3
* Spot.

THE RARER METALS.

Aluminum—Pure, per lb. $1.50
Arsenic—(Metallic), per lb. .40
Barium—(Metallic), per gram 4.00
Bismuth—(Metallic), per lb. 2.75
Cadmium—(Metallic), per lb. 1.00
Calcium—(Metallic, per gram 10.00
Cerium—(Metallic), per gram. 7.50
Chromium—(Metallic), per gram. 1.00
Cobalt—(Metallic), per lb. 6.00
Didymium—(Metallic), per gram. 9.00
Erbium—(Metallic), per gram. 7.50
Gallium—(Metallic), per gram 140.00
Glucinum—(Metallic, per gram. 12.00
Indium—(Metallic), per gram. 9.00
Iridium—(Metallic), per oz. 7.00
Lanthanum—(Metallic), per gr. 10.00
Lithium—(Metallic), per gram. 10.00
Magnesium—Per lb. 4.50
Manganese—(Metallic), per lb. 1.10
Chem. pure, per oz. 10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram. 5.00
Osmium—(Metallic), per oz. 65.00
Palladium—(Metallic), per oz. 35.00
Platinum—(Metallic), per oz. 20.00@25.00
Potassium—(Metallic), per lb. 28.00
Rhodium—(Metallic), per gram. 5.00
Ruthenium—(Metallic), per gm. 5.50
Rubidium—(Metallic), per gram. 2.00
Selenium—(Metallic), per oz. 1.80
Sodium—(Metallic), per lb. 2.50
Strontium—(Metallic), per gm. .60
Tantalium (Metallic), per gram. 9.00
Telurium—(Metallic), per lb. 5.00
Thallium—(Metallic), per gram. .25
Titanium—(Metallic), per gram. 2.2
Thorium—(Metallic), per gram. 17.00
Tungsten—(Metallic), per lb. 1.00
Uranium—(Metallic), per lb. 5.00
Vanadium—(Metallic), per gm. 22.00
Yttrium—(Metallic), per gram. 9.00
Zirconium—(Metallic), per oz. 65.00

BUILDING MATERIAL.

Bricks—Fronts, nominal, ℔ 1,000 .....
Croton 14.00@16.00
Wilmington 20.00@21.00
Philadelphia @22.00
Trenton @22.00
Baltimore .....
Building Stone—Amherst freestone, ℔ cu. ft. 95@1.00
Brownstone, ℔ cu. ft. 1.00@1.35
Granite, rough, ℔ cu. ft. 45@1.25
Granite, Scotch, ℔ cu. ft. 1.00@1.15
Cement—Rosendale, ℔ bbl. 85@1.10
Portland, American, ℔ bbl 2.15@2.45
Portland, foreign, ℔ bbl. 2.40@2.50
Portland, " special brands 2.60@2.85
Roman, ℔ bbl. 2.75@2.90
Keene's coarse, ℔ bbl. 4.50@5.50
Keene's fine, ℔ bbl. 7.25@8 50
Slate—Purple and green roofing, ℔ 100 ft. 7.00@7.50
Red roofing, ℔ 100 sq. ft. 12.00
Black roofing, ℔ 100 sq. ft. 4.25@5.50
Lime—St. John, com and finish., ℔ bbl. 85@ .94
Glens Falls, com. and fin., ℔ bbl. 85@1.00