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TABLE FOR THE CONVERSION OF ENGLISH AND METRIC UNITS.

This table will be published every week in the ENGINEERING AND MINING JOURNAL. It is based on the authority of RANKINE, and is correct to the fourth decimal place.

1 Meter = 3'2807 feet.	1 Atmosphere = 14'7 lb. per sq. in. = 10'333 kilog. per sq. meter = 29'922 in. or 760 mm. of mercury = 33'9 ft. or 10'25 meters water.
1 Foot = 0'3048 m.	1 Kilogramme = 2'2046 lb. av.
1 Liter (vol. of 1 kilog. water) = 0'2202 gal.	1 Pound av. = 0'4536 kilog.
1 Gallon (vol. of 10 lb. water) = 4'541 liters.	1 Deg. centigrade = 5-9 (deg. F. -32°).
1 Kilog. per sq. meter = 0'2048 lb. per sq. ft.	1 Deg. Fahrenheit = 9-5 deg. C. + 32°.
1 Kilog. per sq. mm. = 1422'28 lb. per sq. in.	1 Calorie (kilog. water raised 1° C.) = 424 kilogrammeters = 3'9683 heat-units.
1 Lb. per sq. in. = 703'0958 kilog. per sq. m.	1 Heat-unit (lb. water raised 1° F.) = 772 ft.-lb. = 0'252 cal.
1 Gramme = 15'4323 gr.	
1 Grain = 0'0648 gram.	
1 Kilogrammeter = 7'2331 ft.-lb.	
1 Foot-pound = 0'1383 kgm.	

WANTED—BACK NUMBERS OF THE ENGINEERING AND MINING JOURNAL.

A liberal price will be paid, in cash or subscriptions, for the following numbers of the ENGINEERING AND MINING JOURNAL:

Year.	Vol.	Numbers Wanted.	Year.	Vol.	Numbers Wanted.
1872	XIV.	1 to 18 inclusive.	1875	XIX.	14, 15.
1874	XVIII.	4, 11.	1875	XX.	7, 12, 22, 23.

Address this office.

THE EUREKA-RICHMOND CASE.

The suit recently decided in San Francisco, in favor of the Eureka Consolidated Mining Company, of Nevada, is for several reasons one of the most important that have come before the courts in connection with the Federal mining law. The interests involved were very heavy. The case was presented on both sides with unusual care and thoroughness, by the best lawyers of the Pacific Coast, with the assistance of most elaborate and expensive maps and models, and a large number of experts. The judges who, by agreement of the parties, heard the cause without a jury (Justice FIELD, of the United States Supreme Court, and Justices SAWYER and HILLYER, of the United States Circuit Court), are eminent for intelligence, integrity, and experience in this special branch of litigation. They listened to the evidence and arguments with close attention, and were furnished, before making up their decision, with printed copies of the stenographic report of the whole proceedings. Finally, the points of law involved in this suit are fundamentally important to the mining interests of the West, and have never before been passed upon by the United States courts; so that this unanimous and weighty decision affords much-needed precedents.

We cannot undertake in the present article to review this important case in detail. Our San Francisco exchanges contain abstracts, but not the full text, of the decision. From a personal knowledge of the points at issue, however, aided by the outline of the decision given by the press, we are able to state what we suppose to be the leading questions which it has settled. A more minute account of the interesting geological problems involved will doubtless be given in a paper on the Eureka mines, which is announced by Messrs. KEYS and RAYMOND for the October meeting of the Institute of Mining Engineers.

In two particulars the mining law has received in this decision, for the first time, an authoritative construction. The first relates to the meaning of the term "vein," "ledge," or "lode," as used by the law. The second relates to the effect of the boundary lines of the United States patent, as limiting the operations of the patentee underground.

Neither the laws of this country, nor any other mining codes, ancient or modern, which we have been able to consult, define the thing concerning which they

legislate, called a "vein" or "lode." The definition given by most authors, that a vein is a fissure in the earth's crust, filled with mineral matter subsequently introduced, is a praiseworthy attempt to specialize and render accurate, in the interest of science, a term the popular use of which is much wider. All over the world there are ore deposits which are called "veins" by the miners, and frequently by the most scientific authors also, although the latter have shown them to be sedimentary beds, or impregnations, or segregations; in short, not true veins according to strict classification. It happens that, under our law, this question often assumes a significance which it could scarcely have in any other country. The customs of our miners have made the title of the miner more or less dependent upon the proved identity and continuity of the "vein" he claims, and in many instances this principle has been so construed as to elevate small fissures, which were but the intestinal features of a larger ore deposit, into the rank of independent veins, and subjects of independent ownership. One result has been, we must confess, the admission of "expert evidence" in mining law-suits to an excessive extent. Over and over again, geologists have discoursed before judges and juries concerning subtle distinctions of vein formations; and on their theories the fate of many a valuable property has turned. Another result has been the tacit adoption of Western juries, if not by judges also, of the notion that a continuous tracing of ore, or, at least, of vein-matter "that will assay," from one ore-body to another, is necessary to prove that the two are on the same "vein."

The law of 1872 gives to the patentee the right to the surface patented, together with every vein the top or apex of which lies under that surface, and the right to follow such veins in depth, between the boundaries formed by vertical planes through the end-lines of the patented claim. Troublesome cases will yet arise under these provisions, but it will not be requisite to prove by subtle tests the identity or continuity of veins between the boundaries named; because, whether there be one vein or many, cropping or topping within the patented ground, the patentee owns all. These points, however, may still come up under conflicts about possessory titles, and in cases involving rights which accrued under the law of 1866; and to such instances the late decision will often be applicable.

In the Eureka-Richmond case, the Eureka Company took the broad ground that the term "vein" in the law does not necessarily mean a fissure-vein, but a zone of rock in place, constituting the ore-channel which the miner would consider and work as a vein. In this instance, a belt or zone of limestone, running through Ruby Hill, was asserted to be, in this practical sense, the vein; and the numerous fissures, seams, interstices, vugs, and caverns in this limestone, constituting the receptacles of ore within it, were asserted to be the minor and intestinal features of the great vein.

The Richmond party, on the other hand, claimed to be working, within the said limestone as a country rock, a fissure or system of fissures and ore-bodies, constituting a separate and independent vein, and having an oblique course and dip, as compared with the limestone zone. Following the dip of this vein, as was asserted, the Richmond Company had gone four hundred feet beyond the line which would have been the acknowledged boundary if the limestone zone had been the acknowledged vein. To explain certain peculiarities of this alleged Richmond vein, most of the experts employed by that party declared it to be not an ordinary fissure vein, but a "pipe-vein." This is a term once locally current in Derbyshire and Cumberland, and lately revived by some Utah and Nevada experts, in a very different sense from that in which it was formerly used. A full discussion of it would occupy too much space for our present purpose. Suffice it to say that after hearing both sides, the Court unanimously decided that in this case the limestone zone containing all the ore bodies of Ruby Hill is a vein, within the meaning of the law, although to the geologist it is a sedimentary bed, upheaved and greatly crushed, subsequently filled in all available cracks, crannies, and interstices with ore, which has since undergone changes both in chemical constitution and in physical distribution. It does not follow that every belt of rock traversed by groups of veins is itself a vein. On the contrary, it is only when the subordinate features are clearly subordinate, and not independent of each other or of the inclosing zone, that this zone must be deemed the vein, in the legal sense. In the present case, among the innumerable fissures that occur in the limestone zone, not one was shown to pass out of it into the rock on either side—i. e., the foot wall or the hanging-wall, both of which are well defined. The attempt to make separate veins out of such joints, cleavage-planes, and caverns was, in our judgment, erroneous; and we are glad to think that in many future cases the interests of the miner will be secured by this decision from the peril of "expert" pedantry.

The other point settled in this case is, perhaps, still more important. It has been asserted that, under the law of 1866, the patentee was entitled to the length of his claim named in the patent, whether the end-lines cut off such a length for him or not. The Emma-Illinois case was decided by Judge McKEAN, in Utah, in accordance with this view. We took exception to that decision at the time, and declared that, whenever the point reached a higher tribunal, it would be reversed. This has now taken place. Judges FIELD, SAWYER, and HILLYER hold that the law of 1866 does not, any more than the law of 1872, permit the "swinging" of a patent to suit the course of a vein, if the patent-survey does not happen to cover that course for the full length of the claim. The end-lines of the patent govern everything, and the planes drawn vertically through them, and indefinitely prolonged, are the unalterable, unsurmountable boundaries between which the miner may pursue his vein in depth. This was already undoubtedly the case under the explicit provisions of the later law; but the

Emma Company had applied for a patent under the earlier law, and claimed special privileges thereby. Many mines, patented between 1866 and 1872, might have set up similar claims. But if we correctly understand the synopsis of the recent decision, this point is set at rest, in the manner in which we have always expected it would be settled when good jurists got hold of it. We congratulate Judge BELFORD, of Colorado, whose decision in the Hercules case is, we believe, thus sustained by the highest authority.

The London papers report a meeting of the Richmond Company, the Nevada shadow of which has been contesting this case. The real defendant, as everybody knew, was the English company. At the meeting referred to, only an enigmatical cable dispatch, reporting an adverse termination of the suit, was at hand. Apparently to break the force of the full blow, there was much talk of appealing to the U. S. Supreme Court. We cannot encourage our English friends to this course for their own benefit. They had a bad case, in law, in fact, and in natural equity. They were fairly and most thoroughly beaten. If they go to the Supreme Court on the law points involved, they will be beaten again. But, in the interest of our mining industry, we hope the appeal will be taken, so that the important principles laid down by this decision may be finally settled beyond cavil. Nevertheless, everybody knows that the unanimous verdict of the three men who united in this decision is practically final. The Rev. Mr. PROBART, Superintendent of the Richmond Company, in telegraphing his friends that the decision was "against law and facts," merely betrays his irritation; but, in adding that the Richmond Company will retain possession of the disputed ground during the prosecution of an appeal, he makes an extraordinary statement, for the explanation of which we shall wait with curiosity. According to the reports before us, the decision was accompanied with a direction for the immediate ejection of the Richmond Company.

Meanwhile, that company is now doing what it ought to have done long ago—explore its own ground, instead of its neighbor's. And this process is developing a fine body of ore. True, it is a body which cannot be brought into the late Richmond theory, except by calling it another independent "pipe vein"; but that is no matter. The theory was never worth much, and is now worth less than ever; but the ore may be worth a great deal.

The stockholders have voted to send out a commission to overhaul the management in Nevada, and see if expenses cannot be reduced. It is too late to blame anybody now for the atrocious blunder of getting into the recent suit. As for the honesty and economy of the management, we presume the investigation will throw light on those numerous difficulties and expenses which it is so hard for stockholders at a distance to understand. The only other matter that interests us is the policy of running the refining-works at Eureka. How any one can make a profit by separating silver and lead in the desert, at high cost for fuel and labor, and then shipping both to tide-water, *only paying 2½ per cent. for the carriage of the silver*, instead of shipping all the metal as base bullion, at common freight rates, and performing the separation, or having it performed, where it can be done cheapest, passes our understanding. In other words, to our unassisted vision there seems no better way of shipping silver from the interior than to send it hidden in lead and safe from thieves. But we may get light on this subject from the commission.

The lessons of the law-suit are far from exhausted; but we have given our readers enough for once.

THE UTILIZATION OF ANTHRACITE CULM.

In the marketing of anthracite coal, and its preparation for the market by means of coal breakers, from 20 to 25 per cent. of the fuel is crushed into a dust, known as culm. Vast piles of this waste material disfigure our anthracite coal regions, and its successful utilization has long been a puzzling problem that many have attempted to solve, but, until recently, with little or no success. The general method of putting the culm into market form has been to mold it in the form of bricks or eggs, using some substance to act as cement. This agglutinating substance has sometimes been flour paste, lime, clay, tar, pitch, caking coals, etc., and though some of these are in first cost less expensive than pitch, yet the fact that this lends value to the fuel in its manner of burning has led to its more general use.

In 1876 the "Anthracite Fuel Company" erected works on the Hudson River, at Port Ewen, N. Y., and with praiseworthy energy have persisted in its efforts, till now it is prepared to furnish 250 tons per day of a very satisfactory fuel, which finds a ready market for steam purposes.

The locality selected for the works offer especial advantages. Culm made by the Delaware & Hudson Canal Company to the extent of about 500,000 tons per annum is transported to them economically from Honesdale via canal, at a cost of \$1 per ton.

The loaded boats are brought directly to the Fuel Company's dock, where they are discharged by means of an elevator, the coal being conveyed into two bins, each capable of storing 260 tons. Between these bins is a third of smaller capacity for storing the pitch with which the culm is to be mixed. This pitch is also brought by water, from New York, and costs, delivered at the company's works, \$6.50 per ton.

The process of manufacture consists simply of the thorough mixing of the culm with 10 per cent. of granulated pitch; heating the mixture to about 600 degrees, or above the fusing point of pitch; and finally pressing the material while in this condition into bricks 6 x 10 x 4½ inches, weighing about 14 lb. each. The pressure to which the brick is exposed will exceed 15 tons, and is sufficient to com-

press the material to such a degree that the bricks will bear handling immediately after leaving the press.

All the operations of crushing the pitch, mixing the culm, heating, pressing, and discharging are continuous and automatic, the whole works employing less than 25 men per shift, or, say, 10 tons per day to the hand. The crushing of the pitch is accomplished by two sets of light cast-iron rolls with pyramid-shaped teeth. The crushed pitch is never allowed to collect in any quantity, as very little pressure, especially in damp weather, causes the particles to again adhere. No particular attention is paid to the size of the crushed particles; it has, in fact, been found advantageous to allow the coarse and fine to remain mixed, as it prevents clogging.

The culm and granulated pitch are automatically fed into chutes which carry them to the mixer, which is simply an iron trough with a screw in it. The materials are here mixed and conveyed to an elevator, which discharges them into the fusing cylinder. This is an iron pug-mill resting on a revolving molding table, and heated by means of a steam jacket to about 600 degrees. The molding table is like an ordinary revolving brick machine. It contains ten recesses, the bottoms of which are movable steel pistons, which revolve with the table. As an empty recess presents itself below the pug-mill it is filled with the heated material, and as the table revolves the piston is forced up, by passing over an inclined plane, till the necessary compression of the material is obtained.

To prevent breakage, this inclined plane is hinged at one end and supported at the other by a system of rubber springs and levers. After passing over this inclined plane the piston drops slightly, and the mold in the revolving table emerges from below the fixed plate which retained the material in the mold. The piston is then forced up by passing over a second and steeper inclined plane, and forces the brick from its mold, and an iron guard sweeps it from the table on to an endless belt which carries it to the end of the dock. It is there stowed by hand on the boats which carry it to market.

This fuel hardens rapidly, and apparently bears transportation and handling with little loss from breakage. Its excellent steam-generating qualities were well illustrated in a recent trip of 41 miles over the Ulster & Delaware Railroad. The road rises 2,000 feet in this distance, and the curves on the line frequently exceed 9°. The time occupied in making the 41 miles was 1 hour 4 minutes, during which time the steam gauge showed a loss of only ten pounds. This fuel burns like a semi-anthracite with a short flame, and makes but little smoke. No clinkers are formed in the grate, though the culm yields a very considerable amount of ash. This could be remedied by washing the culm in jigs previous to mixing with the pitch, or, better, at the mines. This washing in taking out the slate would also remove the greater part of the sulphur, the most injurious ingredient in the culm.

The Anthracite Fuel Company manufactures under patents of Mr. J. J. ENDRES, though many improvements have been made during the past year by officers of the company. The success of the enterprise is largely due to the energy and ability of Mr. S. L. CROUNSE, who is, we believe, one of the chief stockholders, and of Mr. S. D. COYKENDALL. These gentlemen have the credit of making a success of this oft-tried problem of utilizing our waste anthracite, and the works, which have now a capacity of 250 tons a day, will probably manufacture 40,000 tons this year. These gentlemen are also manufacturing a very superior article of "Portland" cement, of which we shall have something to say on another occasion.

THE COMSTOCK.

Staff Correspondence of the Engineering and Mining Journal.

In spite of the depression in Comstock shares operations on that vein proceed with as much persistency and regularity as if each mine were in bonanza. In the commercial pages of the JOURNAL will be found the usual weekly report from each of the more prominent mines; but as these reports are prepared more for the examination of brokers than for the ordinary reader, a *resume* of the operations on the great lode will not be without interest.

More interest is now centering in the Suto Tunnel than on any other mining work in the district. The header of the Suto is now less than 2,000 feet from the workings on the Savage Mine, and the noise of blasting is plainly heard by the workers in each. This may seem improbable to many, for 2,000 feet of rock ought to make a formidable barrier for sound, but it is to be remembered, first, that the header of the Suto is about 18,000 feet from the mouth, and that a stratum or cylinder of air of that length furnishes almost as formidable an impediment for the transmission of sound as the solid rock; and second, that the blasts in the tunnel are very heavy, consisting generally of the explosion of about a dozen holes simultaneously. The tunnel is progressing at the rate of 10 feet per day. It has already passed out of the porphyritic last country rock of the Comstock, and is in crevice or vein material, showing that the lode is an enormous one in depth. Inasmuch as several of the great bonanzas of the mine have been found far east of what was formerly called the eastern limit of the ledge, there are well founded anticipations that before the Savage workings are reached some very important discoveries will be made.

When the Suto Tunnel does reach the great Nevada mine, it will find itself nearly 800 feet above the deepest workings in the mine, viz. the shaft on the Savage, which has attained a depth of 2,200 feet. Over a vast area of the lode, however, the tunnel level will be below all workings, and will no doubt prove a great aid in all future operations.

The great bonanza mines, the California and Consolidated Virginia, are main-

taining a combined yield of about $2\frac{1}{4}$ millions monthly. The reserves of ore still in sight are enormous, and, supposing that the firm controlling the mines does not curtail their normal yield for the purposes of stock jobbing, there is no fear of any cessation of dividends for a year to come. The two mines are now turning out 1,000 tons of ore daily. At the lowest depth attained on the claims, 1,850 feet, the ore body still shows finely, and in its upper part many thousand tons are still untouched.

Belcher, Chollar, Ophir, and Justice are the other main producing claims on the vein. Their total daily output amounts to 550 tons, which figure is likely to be maintained for some months to come, if not indefinitely. All the other mines on the belt together are yielding about 100 tons daily, so that the total product from Virginia City amounts to not less than 1,650 tons per diem.

Belcher, which a few years ago was a magnificent bonanza, is still paying expenses, yielding 50 tons daily, and which furnishes the means to continue prospecting for new chambers of mineral. As yet there have been no new discoveries of note, but if the work is persisted in, as there is no doubt it will be, the mine will again be brought into good pay.

In Ophir, which adjoins the bonanza mines, there were recently reports of a great strike, but it has since been denied. The mine is yielding a small quantity of ore, and shows at several points in its deep workings excellent indications.

Chollar, the steadiest producer of ore for some years past, is turning out 90 to 100 tons daily, worth about \$22 per ton. All this comes, however, from workings near the surface. The shaft on this mine is between 1,800 and 1,900 feet deep.

Justice is producing 350 tons daily, which is coming from the neighborhood of 1,000 feet in depth. In this mine a very extensive body of ore is being opened, but because of the California and Virginia bonanzas but little is heard of it. It is of moderate grade, and every development has already been done to raise the product to 500 tons daily, if the management so desired.

Of other mines on the great vein, the Leviathan, Caledonia, Overman, Imperial-Empire, Solid Silver, and Union Consolidated are working in ore, but in none does the yield yet cover the very heavy expenses of deep working. Favorable reports may, however, be expected at any time from these mines. Overman in particular is in a most encouraging condition, and great hopes are entertained that its workings are approaching a large chimney of mineral.

The enormous body of water which for months past has tested the capacity of the great pumps on the Savage & Hale and Norcross shows signs of exhaustion. When this water was struck and flooded the lower levels on the Savage, that mine showed excellent indications on its bottom. As soon as these workings are once more uncovered, prospecting will be resumed in full force.

During the first half of the year the product from the whole vein was \$17,000,000. This corresponds to a value of about \$70 per ton. This, however, is the mill valuation. The actual average assay of the ore mined would reach nearly \$100, as the mills on the Comstock are not saving over 75 per cent.

SUMMER TRIPS AMONG THE MINES—No. 4.

Staff Correspondence of the Engineering and Mining Journal.

There is always one point left beyond the last; exactly as it has been shown that an omnibus always contains room for one more. Georgetown having now been connected by rail with the rest of the world, this little village of Silver Plume, which a year ago had no particular aspirations, is now burning with the desire to be a railroad terminus, and considering whether by any means the railroad can be extended two miles farther up the gulch.

Strictly speaking, Silver Plume is the gateway for the most productive silver district in the State. A million and over in ore passes through its streets annually, and in its vicinity are the four great tunnels which in a few years more will have reached the heart of the range at whose foot the town lies. These, named respectively the Baltimore, Burleigh, Diamond, and Lebanon, have a combined length of nearly 7,000 feet. The mountain rises with great abruptness, and in all a depth of 50 feet per 100 is gained, while in the Burleigh 2,200 feet in length has placed 1,700 feet of rock perpendicularly above its heading. With so much advantage as this, it is no wonder that the mountain side is bored with numerous tunnels, prospecting and developing, and that as soon as a mine is opened to any depth its surface workings are abandoned and connection made with some deep cross-cut.

Unusual advantages are offered in this camp for a thorough and scientific study of the belt of mines by means of these tunnels. On the surface, the slope is covered with discoveries, and plastered three deep with claims. Below, not half as many lodes are found—no, not a quarter. Again, by traversing the range from base to crest along the line of any one of the tunnels mentioned, a collection of the different varieties of granite to be found, when compared with a series of the same rocks cut in the tunnel, will show some rather startling changes in the formation, and will lead to some conclusions, which, if admitted as testimony on any of the mining cases on the hill, would clear up some of the difficulties which now bother both lawyers and clients. The writer, having made a partial study of this nature several years ago, would commend the subject to the mining engineers of the district as one which, if carefully and conscientiously worked up, will be at least exceedingly interesting.

Silver Plume lies in a deep and narrow gorge, about twelve miles below the dividing range of the continent. To the east of it rises Leavenworth Mountain, steeply and sharply, with its bald crest 11,500 feet above the sea. On the west

are Brown, Sherman, and Republican mountains, nearly one continuous range, but divided by shallow ravines, named respectively Brown and Cherokee gulches. Both ranges are spurs branching out laterally from the continental divide. Following these crests to the westward, one is led gradually higher and higher till the eternal snow banks of the divide are reached, over whose summit one looks down into the valleys of the Snake and Grand rivers, which empty their waters into the Colorado of the West.

Standing on Grey's or Irwin's Peak, which are the crowning elevations of the divide at this point, the traveller looks down to the southwestward upon the hills where silver ores were first found in Colorado. About six miles away stands Glacier Mountain, rightly named, for it bears on its slopes many traces of ice and frost, and in its day undoubtedly was the starting point of a huge glacier which extended downwards towards the Blue Valley. It was in 1860 that a party of hunters traveling from Park City, then a flourishing gold camp in Georgia Gulch, towards Central City, found outcroppings near the top of the mountain of very pure argentiferous galena in the Cooley lode, and being out of bullets at the time actually manufactured some by smelting the ore picked up in rude Scotch hearths. The mineral contained a fair quantity of silver, and was abundant, but it was not worked for that metal for several years, and at the time but little was thought of the discovery, for gold was then abundant in the neighboring gulches. To-day, though the cañons along the Blue Valley are still yielding gold, the mountain ranges centering in Grey's Peak are known to be ribbed with silver veins. Geneva, Montezuma, Sts. John, Hall Valley, East and West Argentine, Silver Plume, Brownsville, and Georgetown, containing a combined population of over 5,000 souls, are the outgrowth of the hunters' discovery on Glacier Mountain, and nearly thirty millions of dollars in bullion the result of the developments which followed in their footsteps.

As this entire range of country will, during this summer, be illustrated in the JOURNAL, detailed descriptions of the mines which have made this district so famous will be deferred till the illustrations are completed. To one who has watched the growth of mining in this part of the mountains of Colorado, there are abundant proofs of the inherent stability of the industry and the real extent of its resources. The Clear Creek and Snake River mines have shown no ephemeral growth. True, there was an excitement when such rich ores were found in the two Argentines, and a rush from the gold districts all around. When the Equator and Colorado Central veins were yielding their treasure, Leavenworth Mountain was the Mecca of the prospector and the pilgrim, and when the Pelican and Dives advanced into notoriety the foundations of the brisk camp of Silver Plume were laid. A steady growth year by year has distinguished the district, and this has steadily proceeded against the prophecies of those who would class mining as a business with gambling and speculation. Looking up to the hillsides from the streets of this town, one sees a mountain slope studded thickly with shaft houses, and marked at every hundred feet with the white dumps produced in opening the mines. And in these there are to be found no indications of decay or hard times.

SILVER PLUME, Aug. 9, 1877.

NEW PUBLICATIONS.

THE METALLURGICAL REVIEW. Published monthly by David Williams, 83 Reade Street, New York.

This is the first number of a new monthly, "intended to be a record of current progress, which shall combine the enterprise of a newspaper with the convenience and permanent value of a book." It is apparently planned to comprise both original and selected matter; but the opening number is largely composed of new and exceedingly interesting contributions. Prof. THURSTON discusses the effect of mechanical treatment on the metals, and the practical value of the several known methods of exalting the apparent and the normal elastic limit. Mr. PECHIN furnishes a clear and practical account of the new iron district of Ohio, which will be most welcome to ironmasters. Mr. JOHN I. WILLIAMS gives an admirable paper on the Danks Furnace at the Millvale works of GRAFF, BENNETT & Co., Pittsburg. Mr. METCALF writes on steel, not controversially, but comprehensively from the standpoint of a man of business as well as an expert. Several other articles of importance are contributed by metallurgists and chemists. It is perhaps natural that iron and steel take up nearly all the space—there being but one article, a brief notice of the siphon-tap in lead smelting, by C. KIRCHOFF, JR., which refers to any other subject. But this disproportion may be rectified in future numbers; and at all events, there is little in this number which we should care to see omitted, even to secure greater variety of topics. We should not omit to add that the type and paper are very handsome and the illustrations fairly good. The enterprise begins auspiciously, and, if its high standard is maintained, will deserve and doubtless achieve success.

THE RAIN-TREE OF PERU.—Accounts from Peru bring the intelligence that, in the forests near Moyobamba City, a tree has been discovered called by the Indians "tamia-caspi," or "rain-tree," which possesses remarkable properties. This wonderful vegetable production, observes the *Colonies and India*, we are told, absorbs the moisture of the atmosphere, which it concentrates, and subsequently pours forth from its leaves and branches in a perfect shower, and in such quantity that in many cases the surrounding soil is converted into a bog. We are further informed that it possesses this singular power to a greater degree during the hot dry weather, when the rivers are at their lowest and the water most scarce. It has been suggested to the Peruvian Government by a gentleman who has examined these trees that the experiment of their culture in the more arid parts of that country should be made, with a view to the benefit of agriculturists.

THE VALLEY OF THE COLORADO RIVER, AND ITS GEOLOGY.—VI.*

BAD LANDS AND ALCOVE LANDS SOUTH OF THE UINTA MOUNTAINS.

South of the Uinta Mountains, and beyond the hog-backs on either side of the river, is a district known to the Indians as *Wa-ka-ri'-chits*, or the Yellow Hills. This country is elaborately embossed with low, rounded, naked hills. The rocks from which they are carved are yellow clays and shales. Some few of the shales are slate-colored, others pink; none so glaring and brilliant as the bad-lands of Black's Fork, but the tints are soft and delicate. The whole country is carved by a net-work of water-ways, which descend rapidly toward Green River, and the intervening hills are entirely destitute of vegetation. Looking at it from an eminence, and in the light of the midday sun, it appears like a billowy sea of molten gold.

To the south of these yellow hills, and separated from them by a gently-curved but well-defined ridge of upturned sandstone, there is a broad stretch of red and buff-colored bad-lands. Some of the beds are highly bituminous, and a fresh fracture reveals a black surface, but usually they weather gray. Where these bituminous rocks are found, hills and *mesas* are seen, covered, more or less, with vegetation, and the bad-land forms disappear. Still farther to the south, across White River, we find a continuation of these beds, but here more shaly and interstratified with harder beds, and the alcove structure appears, somewhat like that in the alcove land near Green River Station. These White River alcove lands were, by Gen. Hughes, named "Goblin City."

THE TERRACE CANONS AND CLIFFS.

A few miles south of the mouth of the Uinta, Green River enters the Cañon of Desolation. The walls of this gorge steadily increase in altitude to its foot, where it terminates abruptly at the Brown Cliffs; then the river immediately enters Gray Cañon, with low walls, steadily increasing in altitude until the foot is reached, where it terminates abruptly at the Book Cliffs. In like manner the walls of Labyrinth Cañon are low above, and increase in altitude as we descend the river, until the cañon terminates, as those above, in a line of cliffs. To these last we have given the name of Orange Cliffs.

We sometimes call these Terrace Cañons. They are cut through three great inclined plateaus.

Conceive of three geographic terraces, many hundred feet high and many miles in width, forming a great stairway, from the *Toom-pin Wu-near' Tu-weap'* below, to the Valley of the Uinta above. The lower step of this stairway, the Orange Cliffs, is more than 1,200 feet high, and the step itself is two or three score miles in width. The second step, the Book Cliffs, is 2,000 feet high, or more, and a score of miles in width. The third or upper step is more than 2,000 feet high. Passing along this step for two or three score miles, we reach the Valley of the Uinta; but this valley is not 5,000 or 6,000 feet higher than the *Toom-pin Wu-near' Tu-weap'*, for the stairway is tipped backward.

Climb the Orange Cliffs, 1,200 feet high, and go north to the foot of the Book Cliffs, and you have gradually descended, so that at the foot of the Book Cliffs you are not more than 100 feet above the foot of the Orange Cliffs. In like manner the foot of the Brown Cliffs is but 200 feet higher than the foot of the Book Cliffs, and the Valley of the Uinta is not quite 300 feet higher than the foot of the Brown Cliffs.

To go by land from the Valley of the White River to the *Toom-pin Wu-near' Tu-weap'*, you must gradually, almost imperceptibly, climb as you pass to the south for a distance of 40 to 50 miles, until you attain an altitude of 2,500 or 3,000 feet above the starting point. Then you descend from the first terrace, by an abrupt step, to a lower. Still continuing to the south, you gradually climb again until you attain an altitude of more than 1,000 feet, when you arrive at the brink of another cliff, and descend abruptly to the top of the lowest terrace. Still extending your travels in the same direction, you climb gradually for a third time until you reach the brink of the third line of cliffs, or the edge of the escarpment of the lower terrace, and here you descend by another sudden step to the plane of the river, at the foot of Labyrinth Cañon. In coming down by the river, of course you do not ascend, but you pass these terraces along the plane of the river—the upper terrace through the Cañon of Desolation, the middle terrace through Gray Cañon, and the third through Labyrinth Cañon.

The beds, or series of rocks, through which Labyrinth Cañon is cut, extend under the bed of Gray Cañon, and these run under the beds of the Cañon of

Desolation. At one time the Desolation series and the Gray Cañon series extended over the Labyrinth Cañon series, but they have been washed away.

It will be remembered that in the description of the country lying to the north of Red Cañon and Brown's Park, it was explained that ridges were formed by the unequal progress of erosion through the upturned edges of the formations lying on the flank of the fold.

Thus ridges are seen where the dip of the rocks is at a high angle—often 20° to 45°; but where the dip is at a low angle—from 1° to 5°—such ridges are not found; the cut edges of the formations stand in steep escarpments, or lines of cliffs, while the slope of the summit of the formation is very gentle, so that when you climb one cliff the descent is almost imperceptible to the foot of another. (Compare lines of cliffs seen in Fig. 18 with hog-back cliffs seen in Fig. 7.)

In passing through the last three cañons, we have observed that the rocks thus gently dipped to the north, and so, in following the river to the north, we are constantly running into rocks of lower geological position and greater age. In this way we are able to study successive beds from higher to lower, as we would should we descend a shaft many thousands of feet in depth, as previously explained.

Expand a fold like that of the Uinta Mountains, where the rocks dip from 10° to 90°, to a more gentle curve where the rocks dip at a much smaller angle, so that the inclination is scarcely perceptible to the eye, and can only be determined by an extended leveling

and tracing of the strata, and the hog-backs are thrown farther apart. The escarpments of these hog-backs, facing the axis of the fold, are still lines of cliffs; but the slopes on the opposite sides are so gently inclined as not at once to be apparent, and the streams heading near the brink of the cliffs and running down the gentle slope away from this line, excavate their own valleys and cañons, and so break up the plane of this slope that its inclination is not at once observed. In fact, it can only be discovered as a generalization from a careful study, and such an inclined plateau, when seen from the side away from the axis of plication, would usually be considered a range of mountains. Yet it has some features which readily distinguish it. The peaks are low mountains and hills, bordering the foot of the slope, and the table lands are beyond and above them, near the crest of the cliffs which face the axis.

The bird's-eye view (Fig. 18) is intended to show these topographic features. The escarpment below and in the foreground represents the Orange Cliffs, at the foot of Labyrinth Cañon; the second escarpment, the Book Cliffs, at the foot of Gray Cañon; the third, away in the distance, the Brown Cliffs, at the foot of the Cañon of Desolation. It will be seen that the three tables incline to the north, and are abruptly terminated by cliffs on the south. For want of space the whole view is shortened.

In the three cañons there are three distinct series of beds, belonging to three distinct geological periods. In the Cañon of Desolation we have Tertiary sandstones; in Gray Cañon, Cretaceous sandstones, shales, and impure limestones; between the head of Labyrinth Cañon and the foot of Gray Cañon, rocks of

Cretaceous and Jurassic age are found, but they are soft, and have not withstood the action of the water so as to form a cañon.

These formations differ not only in geological age, but also in structure and color. It will be interesting to notice how the structural differences affect the general contour of the country and modify its scenic aspects.

In the description of the three cañons in the history of their exploration, the attentive reader has already noticed the great variety of geological and topographic features observed as we passed along.

Let us now take a view of the three lines of cliffs. The Brown Cliffs are apparently built of huge blocks of rock, exhibiting plainly the lines of stratification. The beds are usually massive and hard, and break with an angular fracture. The whole is very irregular, and set with crags, towers, and pinnacles. The upper beds of the Book Cliffs are somewhat like those last described, and they form a cap to extensive laminated beds of blue shales, in which we see exhibited the curious effects of rain sculpture. The whole face of the rock is set with buttresses, and these are carved with a fretwork of raised and rounded lines that extend up and down the face of the rock, and unite below in large ridges. The little valleys between these ridgelets are the channels of rills that roll down the rocks during the storms, and from one standpoint you may look upon millions of these little waterways.

THE INTERNATIONAL COAL Co.'s property at Sydney, N. S., was sold by the sheriff on the 30th ult. under foreclosure. Mr. Day, of New York, opened the bidding with \$50,000. After a spirited contest the property was knocked down to Mayor Beaudry, of Montreal, for \$200,000. There is a mortgage on it for over \$1,000,000.

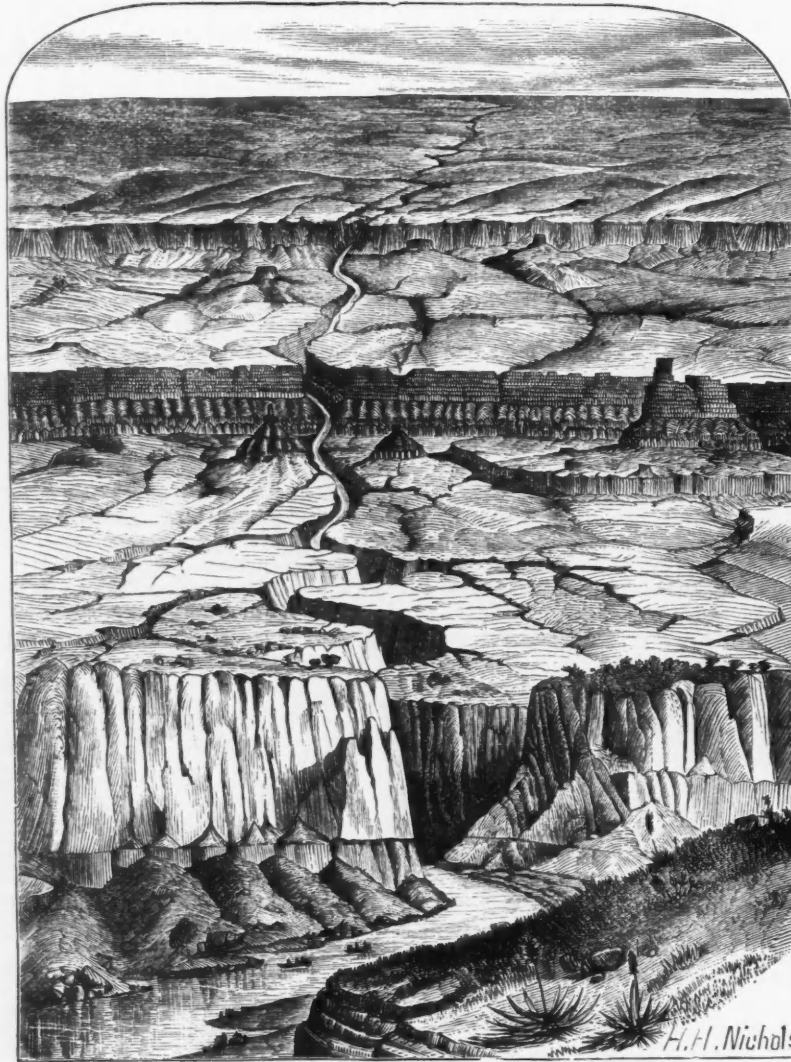


FIG. 18.—BIRD'S-EYE VIEW OF THE TERRACE CANONS.

* Extracts from Report of Major J. W. Powell on *The Exploration of the Colorado River of the West*. Washington, 1875.

IRON ORES OF SWEDEN.

AS SHOWN AT THE PHILADELPHIA EXHIBITION.
Special Correspondence of the Engineering and Mining Journal.
(Continued from page 168.)

The felsitic dike, before spoken of, touches the ore along a line varying from 500 feet below the surface to where its outcrop touches the surface alongside one of the mine openings. The ore obtained from these mines, of which a considerable number were represented by specimens in the Jern-kontoret's collection, is a dense magnetite having a columnar fracture. Thin veins of pyritiferous material are interlaminated with the ore, the fractures due to the columnar structure being generally perpendicular to these laminations. It will be seen from analyses Nos. 1, 2, 3, and 4 in the table that the ore contains nothing but magnetic oxides, the amount of which is about 70 per cent. The silica varies from 8 to 18 per cent. The percentages of lime and magnesia in these and a large number of other analyses are in general nearly equal, varying from 4 to 8 per cent. The great value of these ores for producing iron for steel making purpose consists in the fact that they contain such low percentages of phosphorus and sulphur. The former element is practically absent, while the latter is almost entirely removed by roasting before the ores are charged into the furnaces. During the year 1874 there was raised 806,376 Swedish centners, or 32,749 tons (2,240 lb.), of ore from the Dannemora mines.

A map illustrating the Norberg Mining District was also shown in the collection of the Jern-kontoret. The ore-bearing field occupies a belt of country about one mile broad and five miles long. A mass of intrusive granite borders the eastern side of the gray eurite in which the ore is found.

The ore occurs in detached lenticular masses, most of them being in a space about a quarter mile wide. The ores consist of interstratified magnetites and hematites, with pyroxene gangue. The larger part of the ore in the main belt is specular. About a quarter mile west of the belt of ore there are several lenticular masses of crystalline limestone in which there are mines of magnetite. In several places in the field, where the gray eurite borders the dark eurite, crystalline limestone in thin bands is interstratified.

A map of the Persberg Mining District shows the position of the ore beds

of which is the very large proportion of ore to the fuel with which it can be smelted, for as yet the ore mined has been used in nothing but charcoal furnaces in Sweden and Finland. The comparative inaccessibility of the mines and want of means of cheap transportation have prevented the economical exportation of the ores or the importation of mineral fuel with which to smelt them. Another reason why the mining operations have not been carried on systematically is that the continuance of the smaller deposits could not be depended on with certainty, and also frequently men owning portions of the same bed have preferred to work independently in an imperfect manner, rather than combine their operations so as to use simple systems of hoisting, ventilating, and pumping, a disposition too often manifested in the management of many of our American mines.

Almost without exception the miner are now worked in Sweden by first sinking shafts or inclines, or driving tunnels until the ore is found to have solid wall rocks. Levels are then carried into the ore, which is generally extracted by underhand stoping, pillars of ore being left to support the roof or wall rocks. In some cases where old workings have given way, filling them with the gangue rock and other rubbish, the use of overhand stoping has been resorted to. A practical difficulty in the way of this method of working exists in the fact that in many of the mines the ore extracted is of such purity that too small an amount of gangue material is left to answer for filling. The principal expense in the extraction of the ore naturally consists in the operations attendant on blasting.

The drilling is done, except in a few mines, by hand, one man generally holding both the drill and striking hammer. The bore holes are from 1 to 1 1/4 inches in diameter, and the price paid for drilling them is from 6 1/2 to 20 cents per foot with underhand work, and in overhand work as much as twice that amount is frequently paid. The miners, in addition to these wages, frequently have certain privileges accorded to them by the proprietors, such as use of houses, fuel, land for raising of vegetables, etc., so that they are able with these helps to live on what seems to us small wages.

The amount of drilling per miner varies according to the nature of the rock from 5 to 8 feet per day, and in the case of very easy working to as much as 12 feet per day. These figures are of course for drilling downward through the rock.

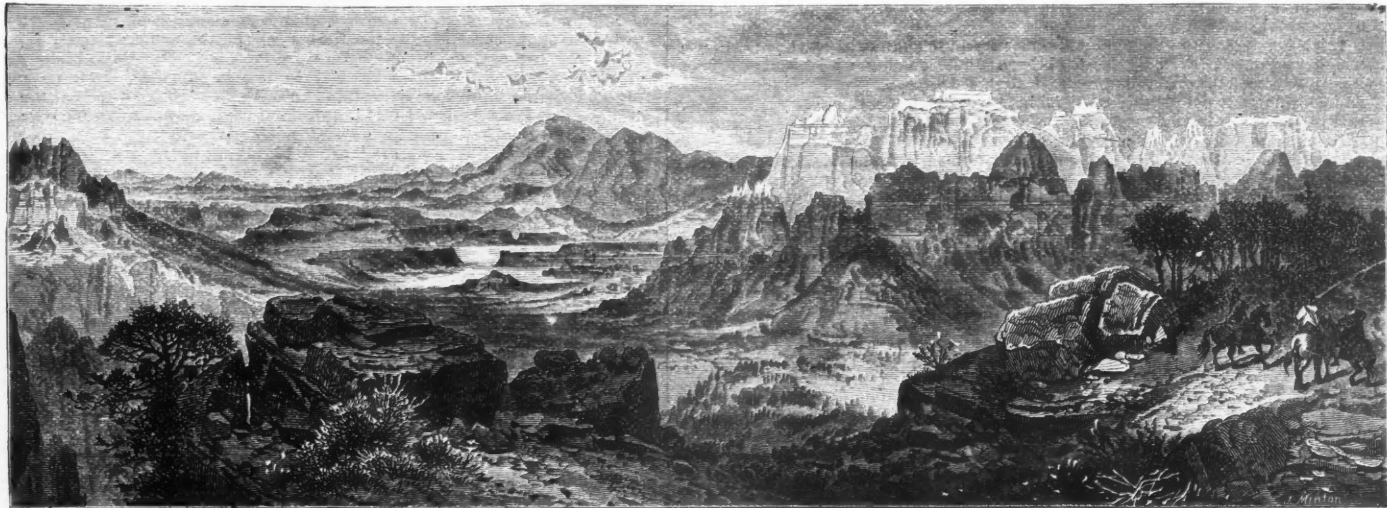


FIG. 19.—ALCOVE-LANDS AND BAD-LANDS SOUTH OF THE UINTA MOUNTAINS.

which have been worked, as well as those whose positions have been worked out by the magnet. The mass of the country rock is a fine-grained gray eurite, which has been broken by masses of granite. The beds of magnetite are in lenticular masses, often much bent in horizontal section. The ore is found in a pyroxene gangue mixed with garnets. The location of a number of ore deposits has been made, which lie under the waters of the lake to the south, and east of Persberget. In general the ore bodies as well as the pyroxene masses in which they occur have a northwest strike. A few of the ore deposits are in amphibole.

Several large masses of crystalline limestone and doleomite, surrounded by pyroxene, are found near Persberget. The principal mines have small railroads to convey the ore from them to the lake. The Grangesberg District, of which a map was shown in the collection of the Geological Survey, is located in north latitude 60° 5', and 3° 15' longitude west of Stockholm.

The eurite carrying the ore is bordered on the east by a red granitic gneiss. The principal ore deposits are found in a band of the eurite about 1,800 feet wide and 12,000 feet long. The ore is in long narrow masses, which taper off at both ends into points, the width of the larger deposits seldom exceeding fifty feet. Some of the mines contain magnetic ore, while others have interstratified magnetite, with specular ore.

Some of the magnetic beds contain so much phosphorus under the form of apatite as to be worthless for working.

The Gellivare mines, which are in the northern portion of Sweden, would, but for their inaccessibility, be among the most important in the country. A map which has been made of these beds shows one principal deposit which ranges in thickness from 100 to 500 feet. It consists in places of a central mass of specular ore surrounded by magnetite. All of the ore bodies have a strike in a northeast direction. The rocks surrounding the ore have not yet been thoroughly studied, but the position of several masses of granite and gneiss have been located upon the map.

The Kirunavaara and Luossavaara mines are located in the same district as Gellivare. This contains one principal bed of magnetic ore, which has an extent of 11,000 feet, and which in places is 500 feet across. Several masses of porphyritic red hallefinta border the central part of this ore mass on its northern side near the center. A band of gray hallefinta is also found on the northwest extremity of the same ore body. The production of ore from these and the Gellivare mines during the year 1874 was 4,107 tons.

The methods of mining which are pursued in Sweden are in a great many of the mines very crude. This is due to several causes, one of the most important

The explosives used are powder and various nitroglycerine compounds, the use of the latter substance in its unadulterated state having been forbidden by the government in 1868, owing to a disastrous explosion which had taken place. Quite recently these regulations have been so relaxed as to permit its use, and several mines have employed it in their blasting operations. As will be remembered, Nobel, a Swede, was the first one to use this substance practically as an explosive. The amount of ore blasted out with ordinary powder is from 2 to 3 tons per pound, and with the nitroglycerine compounds from 5 to 9 tons.

The ore is conveyed from the workings to the shaft or inclines, where the distance is short, in hand barrows, and it is only recently that underground railroads have been introduced in the mines. Where barrows are used the ore has to be reloaded before being brought to the surface, an operation both costly and also hindering the active working of the mines. In the mines which are operated through a vertical shaft the ore is taken out in barrels, which hold from 6 to 8 cubic feet or from 800 to 1,400 lb. of ore.

When the ore is raised through slopes, it is drawn up in similar barrels which run on slides, or it is loaded in wagons which carry from 1,400 to 2,000 lb. The cost of the ore delivered on the bank varies from 60c. to \$2.20 per ton (gold), as are all prices which have been given. The motive power generally used in raising the ore is steam, which, owing to the scarcity of fuel, forms a considerable item in the expense of mining. Sometimes when water power is available use is made of it in raising the ore.

The contrivances commonly employed for pumping water from the mines are even more primitive than those used in hoisting the ore.

The pumps in many of the mines work only on the suction principle, and consequently have to be placed within about 30 feet of each other. In a few of the deeper mines, however, force pumps are used, in one of which the water is raised 700 feet by direct lift. The power most generally utilized to work the pumps is that derived from waterfalls. This generally necessitates the transmission of the power through long distances, which is accomplished by endless wire ropes passing over pulleys, or by reciprocating wooden beams resting on movable supports. By this latter arrangement the former is sometimes conveyed for a distance of 10,000 feet. Some of the mines have to employ steam power for their pumping operations, as well as for hoisting, and at present there are about 100 engines of from 10 to 16 horse power each, employed for hoisting and pumping at the various Swedish mines.

The present price charged by the mine owners for their ore is from \$1.40 to \$2 per ton, delivered on bank.

Nearly all the furnaces which are in operation are situated at considerable dis-

tances from the ore which they use, owing to the exhaustion in times past of all the wood adjacent to the mines.

The ore, then, in many cases is drawn in sledges during the winter from the mines to the furnaces. The building of numerous railroads and the connecting of lake systems by navigable canals have done much during the past few years to permit the ore to be carried more expeditiously and cheaply.

During the year 1874 there was raised in Sweden, from 696 mines which were in work, 807,887 tons of hematite and magnetic ore. Of lake and bog ore there was raised during the same year 4,601 tons.

The labor employed in the mining of the iron ores during the same year is as follows: 6,542 men in constant employment; 495 men in occasional employment; 460 women and children employed; 7,497 total were employed. E. N.

CALORIMETRIC INVESTIGATION OF THE CARBURETS OF IRON AND OF MANGANESE.

By L. Troost and P. Hautefeuille.

Translated from the *Comptes Rendus* of 1875, for the ENGINEERING AND MINING JOURNAL, by Chief Engineer Isherwood, United States Navy.

When iron and manganese are heated with charcoal, they take up a variable proportion of carbon, and form products well known and accurately described, at least for iron. The employment of the bichloride of mercury, thanks to the labors of M. Bousisingault, furnishes a method of analysis at once elegant and very exact, which permits the discrimination with certainty of the graphite disseminated through the mass of the metal, and of the carbon combined with it. But, is the carbon really combined, or is it only dissolved in the iron? That question cannot be answered by analysis alone.

Having the permission of M. Berthelot to resolve analogous questions by means of the calorimeter, we undertook some calorimetric determinations on pure iron, and on iron more or less carburated; and in the same manner we examined iron more or less rich in silicium, in sulphur, and in phosphorus. Manganese, whose use in the industrial arts is general, required a similar investigation, which we extended to nickel and cobalt, in order to multiply the terms of comparison. As the humid bichloride of mercury attacks all these different substances, we employed that reagent in the calorimeter, so as to obtain finally a comparable state.*

I. *Carburated Iron*.—We operated on a very pure charcoal iron, one portion of which was poured extremely thin to obtain a sudden cooling, while another portion was slowly cooled. We thus procured, first, a white cast iron as fragile as glass, and containing 4 per centum of combined carbon; second, a fine-grained gray cast iron, containing 2.8 per centum of combined carbon, and 0.9 per centum of carbon in the state of graphite.

One gram of that white cast iron, when treated with the bichloride of mercury, disengaged 861 calories.

One gram of that gray cast iron, under the same conditions, disengaged 845 calories. The heat of chloruration of the white cast iron was thus found to be greater than that of the gray cast iron.

The similar treatment of one gram of iron nearly free of carbon disengaged only 827 calories.

From this data we deduce the following heat of chloruration, at the expense of the bichloride of mercury, of equal weights of iron more or less carburated: †

1.000 gram of iron containing a trace of carbon.....	827 calories.
1.040 gram of gray cast iron (containing 1.000 gram of iron).....	879 "
1.041 gram of white cast iron (containing 1.000 gram of iron).....	866 "

These results, obtained in experimenting on metal prepared with care in order to avoid the interferences due to the presence of silicium, sulphur, or phosphorus, establishes the fact that cast irons considered as combinations belong at ordinary temperatures to the category of compounds formed with absorption of heat, calculating the latter from their elements. It is more reasonable to consider them as simple solutions. We shall find that manganese behaves differently; its combinations with carbon being formed with disengagement of heat like the most stable compounds of chemistry.

II. *Carburet of Manganese*.—Manganese prepared by reducing the red oxide with charcoal in a lime crucible can be obtained more or less carburated. When these carburets are treated by the bichloride of mercury, they disengage very different quantities of heat according to the quantity of carbon they contain. A carburet having 4.8 per centum of carbon disengages a great deal more heat than white cast iron equally rich in carbon. We ascertained its heat of chloruration, at the expense of the bichloride of mercury, to be 1,190 calories; while another carburet prepared in the same manner, but containing 5.8 per centum of carbon, disengaged 1,010 calories under the same circumstances. One per centum of carbon additional lessened the heat of chloruration 180 calories.

Finally, by keeping the manganese fused in a crucible with charcoal, a carburet was obtained containing 6.7 per centum of carbon. ‡ This carburet, saturated with carbon, is attacked with difficulty by the bichloride of mercury, and disengages still less heat than the two preceding carburets, namely, only 260 calories per gram. This considerable loss of heat, analogous to what accompanies the production of the most strongly marked combinations, appears to us of such nature as to warrant the conclusion that the two substances are combined. The centesimal composition of this carburet corresponds to the simple atomic formula Mn_2C . By subjecting this very carburated metal to slow cooling, we obtain true solids of cleavage.

III. Manufacturers now furnish crystalline products (the ferro-manganeses of commerce) containing iron, carbon, and a large proportion of manganese; our calorimetric experiments were made on specimens of three series containing manganese and iron nearly in the proportions of Mn_2Fe_3 , Mn_2Fe_2 , and Mn_2Fe ; the proportion of carbon varying between 6.2 and 6.7. The quantities of heat

* The calorimeter employed is the *thermometre a calories* of M. Favre, and was situated in a cellar having a nearly constant temperature. The substances were filed or pulverized at the moment they were used, mixed dry with forty times the weight of bichloride of mercury, and placed in the platinum muffle of the calorimeter. The addition of ten cubic centimeters of water and the use of an agitator allowed the determination of the reaction in a short time for the calorimetric observations.

† The quantities of heat furnished at the apparatus allowed the comparisons to be made directly; nevertheless, in order to render our results easily comparable with those obtainable by others employing a different method of operation, we ascertained the heat of chloruration of the bichloride of mercury. This fundamental datum was deduced from a comparison of the heats of chloruration of zinc by hydrochloric acid and the bichloride of mercury. The number we deduced from our experiments, starting from the calomel precipitate, is 21,800. M. Berthelot, in causing gaseous chlorine to react on calomel, found that the transformation of this salt into dissolved bichloride was accompanied by a disengagement of from 20,000 to 22,600 calories.

‡ The whole of this carbon is in that particular state which permits it to easily burn in air when isolated by the bichloride of mercury.

disengaged by one gram of these three products when acted on by the bichloride of mercury were 307, 239, and 431 calories.

If we calculate the heat of chloruration, beginning with the carburet of manganese, Mn_2C , and of the most carburated iron, † we obtain much larger numbers than those deduced from the experiments; hence, these ferro-manganeses are formed with disengagement of heat, and should accordingly be considered as more stable than the carburet of manganese.

The calorimetric determinations seem to establish:

1st. That carburated iron is formed with absorption of heat, calculating from its elements. This fact places cast iron in the category of either explosive substances or of solutions.

2d. That manganese and carbon in uniting disengage a great deal of heat. In this relation the carburet of manganese, Mn_2C , is comparable with the most stable compounds of mineral chemistry.

3d. That all the combinations of iron, of manganese, and of carbon are accompanied with great disengagement of heat. The ferro-manganeses are, therefore, true combinations.

THROUGH THE UTAH MINING DISTRICTS.—III.

(Special Correspondence from our Western Office.)

As a good many readers of the ENGINEERING AND MINING JOURNAL may not have a clear impression of the magnitude and location of the *Little and Big Cottonwoods* from their somewhat euphonic name and the traditions of the *Emma* mine, I have thought it might be well to preface the following summary of the status of mining affairs in these districts by a short statement of their position, surroundings, and approachableness, which may tend to dispense any ideas, such as I myself had entertained, that a visit to them even during the month of August was an undertaking of some magnitude, requiring a little pluck and a determination to endure no small amount of hardship and inconvenience.

Little Cottonwood and *Big Cottonwood* are names given to two mining districts, not towns, and they are not such widely separated and distinct districts as one might suppose, the former covering and including the mines on one slope or side of a hill or range, and the latter applying to the mines on the other side of the same hill or range, all being included within an area of three to four miles in length, and none of them above timber line, although for all practical purposes some might as well be, as the timber in the immediate vicinity is nearly all cut off. *Little Cottonwood* faces southwest, and *Big Cottonwood* northeast. The names apply more broadly to two large cañons heading in the Wasatch Divide, some twelve or fourteen miles from the foot-hills of the great Jordan or Salt Lake Valley, *Little Cottonwood* having a general westerly course by south, and *Big Cottonwood* a general northerly course by east, the spur of the range on which the mines are located, beginning at the apex of the obtuse angle and running northwesterly till it strikes the high range running north and south, forming the east wall of the Salt Lake Valley, whose grand rugged peaks lend their beauty to the scenery of the valley where dwell the "Saints." *Alta* is the "camp" for both districts, and lies in *Little Cottonwood* right at the foot of the hillside where are the mines, within a stone's throw of the *Emma* buildings. Having now located the town, etc., I will proceed to show how easy of access it is, enjoying in this respect advantages as great as Georgetown and Central City, Colorado, with the exception that the traveler is obliged to change cars four times after leaving Chicago or San Francisco to reach *Alta*. Taking the 7 A. M. train from Salt Lake City on the Utah Southern Railroad, Sandy (12 miles) is reached about 8, and the traveler changes cars to the Wasatch & Jordan Valley Railroad, narrow-gauge, and is carried up to the mouth of the Cañon to Wasatch (some 8 miles), where he again changes cars, this time being transferred to a small six-seated open car drawn by two stout mules.

It is some ten miles from this point to *Alta*. The grade at some places is 600 feet to the mile, which a steam locomotive would have difficulty in climbing. The road for nine miles is covered by one unbroken snow shed, which gives one the sensation of riding through a log cabin, all very jolly in winter, but not so pleasant in summer when the towering peaks of the cañon are things of beauty and joys for the time being. When the road was being built three rattlesnakes killed daily was the average, but they seem to have left entirely, as "sore heads" were getting to be altogether too common. The heavy snows obliged the railroad company to build the shed so as to enable them to run regular trains during the winter months. All incoming freight has to be pulled up by mules or horse-power, but outgoing freight, in the shape of ore, is loaded at *Alta*, and with a man at the brake for every two cars, they roll down the valley by the force of gravity at any rate of speed the brakeman may desire, one hour being generally the running time down, while from two to three hours are employed in going up. The "locomotives" or mules are sometimes led down behind the cars, or are driven down by the wagon road to Wasatch.

Alta, like most mining camps, is rather primitive in its architecture, the houses being all built of wood, and tumbled in promiscuously along the main street, without regard to size or symmetry, the fronts of the stores being in some cases squared up on a level with the apex of the roof, and sometimes higher, which affords ample space for the tradesman's sign and gives the street an air of fullness.

The town is 8,400 feet above the level of the sea, and had its birth about the year 1870, when the *Cottonwood* mines began to come into prominence. At one time, some two years ago, it was a very "lively" town; not in the bowie-knife and six-shooter sense, for *Alta* has been remarkably free from these unpleasantnesses; but at the time when the *Emma* was working and employing nearly two hundred men, and new discoveries and strikes were being made, everything was in a booming condition, and the town was full of men.

This season the "camp" has quieted down very considerably on account of the depreciation in the lead market, on which the mines of this district are largely dependent, being principally lead producers. The mines are as good, if not better, in one sense, than ever they were, because every day adds to their development more or less, and consequent worthiness of confidence and knowledge of their permanence, etc.; but when inside of sixty days the basis of the percentage of lead contained in ores is raised by the smelters or purchasers from 30 per cent. to 40 per cent. per ton, it makes a great deal of difference to the miner as to whether he can mine to a profit or not. The poor miner is often obliged to stop work on his mine, as it is a matter of bread and butter with him, while the rich miner does not care to mine for fun, and "shuts down" to wait for a better market; and the prospector is reduced to the condition of the desert traveler who would gladly exchange his bag of diamonds for a loaf of bread, but there's no bread. The mines here are now getting their share of the hard times. As

* This carburet would, according to the last researches of M. Bousisingault, have a composition corresponding to Fe_2C .

there are in business circles "houses" that are well established and strong enough to stand the heavy strain of the general stagnation, so there are mines at the Cottonwoods that, on account of their large development and capital and large ore bodies, are able to go right on producing and shipping, even if their profit is reduced \$5 a ton; but we notice that many little items of expense are closely watched in the management of the best of them. Within two weeks I have seen half the hands in one of the largest and finest mines in the Territory "knocked off" for half a day, because the water in the shaft was giving some little trouble, or the timbers were not quite ready to hand, and the men could not work to a thorough advantage, etc.; and in another, because the men attending to one of the air drills were needed elsewhere during the afternoon, the other air drills and engineers at the compressor, etc., were all "knocked off," fires drawn, etc., in order to avoid any disadvantageous expense. This was all perfectly correct, perhaps, and it only goes to show how careful and economical even the best mines have to be. The dullness at Alta is, therefore, easily accounted for.

There are at present in camp and at the mines some 600 men all told. I regret to say that Alta, for a town of its size, is much given to whiskey, cards, and licentiousness, but I do not know as it is any more so than many other mining camps. The town is not metropolitan enough to indulge in even a constable or policeman. On Saturday nights when the miners (mostly Cornish and Irish) come down to town, a general carouse is indulged in, faro banks, "hardy-gurdies," and gin mills keep open house, and the principal surprise to a stranger is that there are so few broils and so little real trouble. At best a black eye or a broken nose is the worst injury apparent, and in one instance which came under my observation, a "fuss" over a game of poker, so quick was the bar-keeper to interfere that not even a scratch was inflicted by either combatant. Perhaps this open manner of conducting the "business," however, is better than the hidden secrecy of large cities, for one can at least see the evils in all their hideousness, and avoid them.

The climate of Alta in summer is delightful and invigorating, with pleasantly warm days and cool, refreshing nights. In winter, however, old Boreas holds high carnival, and snows pile bank on bank, so that "beware the awful avalanche" has occasionally a terrible significance. Last winter (and it was a mild one for Alta, so they told me), the snow was piled in the main street so high that 18 steps had to be cut down through it to reach the door of one of the principal groceries. The valley is narrow and the mountains precipitous and steep on either side, and if the snow once starts near the top it becomes a mighty rushing avalanche ere it has gone two hundred feet. Twice it has reached the extreme upper portion of the town, once burying in its icy folds five persons. Hardly a winter passes but some one is killed in these snow slides, which are one of the things most dreaded in this district. The slides have become more frequent of late on account of the timber being all cut off which formerly held the snow together. It is on account of the snow that in winter the town is not as lively as in summer, most of the miners preferring to stay at the mines rather than risk the dangers of a trip to town. The difficulties of mining in winter in the Cottonwoods are naturally great, the storms and snow offering serious impediments to transportation. Only those mines that are operated with the aid of considerable capital can be worked to advantage during the winter, as large stores of provisions, tools, powder, and even timbers have to be laid in. As an instance, the *Antelope and Prince of Wales Company* laid in last October 40 head of cattle, 50 sheep, 5 hogs, which meat was hung up and frozen solid, and 10 tons of flour, and other things in proportion. Wood in Alta is worth \$8 a cord; coal, \$22.

If Altaites think that I have told too much of the unvarnished truth about their winters, let me appease them by stating a few facts about the mines, which I think will warrant me in saying that all the drawbacks are almost if not fully compensated for by the value and worth of the mines themselves, as they present many points of advantage not enjoyed in many other mining districts.

STATEMENT OF BULLION AND ORE SHIPMENTS FROM SALT LAKE, UTAH, FOR WEEK ENDING AUG. 11, 1877.

Consignor.	Consignee.	No. Cars.	No. Bars.	Bullion.	Ores.
Scott & Anderson (Mingo).	Pennsylvania Lead Company..	7	1,400	148,688	.....
" (Telegraph)	" " " " " "	5	1,100	104,922	.....
" (Morgan)	" " " " " "	3	738	64,622	.....
G. Billing	Hagan & Billig, N. Y.	5	1,175	104,368	.....
B. M. Du Rell	" " " " " "	5	460	40,526	.....
F. J. Pascoe	" " " " " "	2	403	40,004	.....
Flagstaff F. Company	Omaha S. & R. Company.....	8	2,025	168,275	.....
Eureka Hill Ore	S. Alston, Chicago.....	2	.....	.....	45,300
Live Pine Ore	" " " " " "	1	.....	.....	20,500
B. M. Du Rell	St. Louis S. & R. Company...	1	230	20,245	.....
Winnemuck Ore	W. K. Sloan, Hilliard.....	1	.....	.....	21,500
Mono Ore	" " " " " "	1	.....	.....	22,000
Douglas Ore	" " " " " "	2	.....	.....	41,426
Eureka Hill Ore	" " " " " "	1	.....	.....	21,657
Total.....		41	7,531	691,740	172,383

The Flagstaff furnace will shortly close down on account of the expiration of the lease of Messrs. Mather & Geist.

A slight fire occurred at the Germania works on the 14th inst., destroying only the assaying room.

ROSE.

ALTA, UTAH, August 14, 1877.

THE PRESENT CONDITION OF THE ZINC INDUSTRY OF UPPER SILESIA.

By Max Georgi.

The ores treated for zinc in Upper Silesia are of two classes; namely, calamine, averaging from 11 to 15 per cent., and blende, with from 23 to 30 per cent. of zinc. The former are calcined in the usual way (? in kilns), and the sulphureted ores in double-bed calciners (Fortschaufelungsofen), except in one establishment near Schoppinitz, where Hasenclever's patent furnace is used. Ordinarily the calciners are erected in blocks of four, having chimney flues and passages for drawing the roasted ore in common, in order to economize space. The Hasenclever furnace has a step-grate fire-place, and, with a consumption of 40 cwt. of coal slack in twenty-four hours, produces 70 cwt. of calcined blende, not containing more than 1 per cent. of sulphur. The ore, which is fed continuously by a small water wheel, must be reduced to particles of 3 millimeters in diameter and free from dust; if they are of larger grain the roasting cannot be effected, and if smaller they will not travel freely down the incline of the bed. For the flat calciners a grain of about 2 millimeters is found to be the most convenient size. It is therefore necessary to prepare the ore for the patent furnace by a system of rock breakers and coarse and fine crushing rolls; while for the ordinary furnaces it is ground under edge mills.

The working beds of the double calciners do not exceed 7-2 feet in breadth, while the length varies from 18 feet to 25 feet. Increased length has the advantage of more fully economizing the heating power of the fuel, but makes

the furnace difficult for one man to manage, so that the roasting may be only imperfectly effected. As a rule it is not considered desirable to employ a special fireman, the heat being better under control when the entire management of the furnace is in the hands of one man. The average yield of each calciner is from 60 to 64 cwt. of calcined blende per twenty-four hours, with a maximum of 1 per cent. of sulphur for a consumption of 30 cwt. of coal. The progress of the calcination is in some works controlled by the following simple test: A sample of the charge is strewn upon the surface of 20 or 30 grains of chlorate of potash melted in an iron ladle. When if no flash of burning sulphur is produced, the ore is considered sufficiently desulphurized.

Calamine ores, as mixed for reduction, do not as a rule contain more than 14 per cent. of zinc. The blende, which is usually very pyritic, is richer, and is added in sufficient proportion to bring up the produce; in this way very poor calamines, containing only 7 to 9 per cent. of zinc, are worked up. Mixed coal slack and cinders are used for reduction; from 3 to 3 1/2 bushels of the former and 5 1/2 to 6 bushels of the latter being required per 100 cwt. of calamine. With pure blende, the quantity is increased about 11 per cent., partly on account of the greater difficulty of reduction, but more particularly to protect the muffle against increased corrosion.

The cinders are small particles of coke breeze obtained from the fire-places of the puddling and heating furnaces in the neighboring iron works, where they are collected in water cisterns placed in the ash-pits. They play but a very subordinate part in the reduction of the zinc oxide, being almost combustible; their chief function being to prevent the formation of easily fusible slags by the action of the iron in the ore upon the substance of the muffle. The weight of the charge varies with the richness of the ore in zinc; with blende it is usually only half that of calamine. In the larger-sized muffles about 230 lb. of calamine with 11 to 12 per cent. of zinc is a usual quantity.

The muffles vary in size according to their position in the furnace; the following being the limiting dimensions:

Length.....	5-2 feet to 6-6 feet.	
	Fore end.	Back end.
Height.....	13-7 inches to 21-6 inches.	23-2 inches to 24 inches.
Breadth.....	6-0 " " 7-8 "	8-7 " " 10-6 "

The length is governed by the heating power of the furnace, shorter sizes being used in the cooler parts, or in the last stages of its working, before being rebuilt; while the height depends upon the fire-resisting power of the clays; and the breadth upon the comparative reductibility of the ore. The materials are lean (sandy) clays from Galicia, plastic clays from Silesia and Poland, and sherds of old muffles ground under edge rolls to fragments 8 or 10 millimeters in diameter. The ordinary mixture is 3 parts of burnt to 2 of lean and 1 of plastic clay. The molding is effected by hand, the sides being raised from sheets of clay over wooden cores. Generally four or five muffles are kept in hand by the same man at once, so as to save time and to insure uniformity in drying. When finished they are air-dried for at least fourteen days, and before setting are raised to a bright red heat in a tempering oven for twelve or fourteen hours. These are ovens of sufficient capacity to take from sixteen to twenty-four muffles, to supply a demand caused by excessive breakages, etc. The average life of a muffle is from thirty-five to thirty-six days, each one being numbered and marked by the maker, who, in the event of his work giving out too soon, is liable to a fine. From twenty to twenty-four muffles are molded by one man in six working days, the clay mass being supplied by the works. The receivers for the reduced zinc are made of ordinary potter's clay mixed with a small quantity of burnt clay or coke dust, and they continue in use until the incrustation of zinc oxide prevents the introduction of the charging shovel, which usually takes place in from two to three weeks. They are made by the smelters themselves, the mixed clay being supplied by the works.

TO BE CONTINUED.

LOWE GAS.

TO THE EDITOR: SIR—"J. W. S." inquires: "Have we not in G. S. D.'s remarks upon the Lowe Gas Process, in the JOURNAL of August 25, another example of loose theorizing, when he explains the absence of oxygen by its having combined 'with its due proportion of surplus H to form water'? For all the O and H present in the process are the sole result of the decomposition of water, and to my dull comprehension it would require all the H to reconvert the O to water."

To which I respectfully reply that "J. W. S.'s" inquiry is rather an example of loose reading, as the gas under discussion is a carbureted water-gas, containing the hydrocarbon products of 3 gallons of petroleum to each 1,000 cubic feet.

If he, or any other reader of your JOURNAL, will present any sounder theory to account for the following facts, I am sure there are many who will be interested to hear it.

By the Lowe process, the use of 50 lb. of anthracite coal, all told, and 3 gallons of crude petroleum gives 1,000 cubic feet of gas of the following composition, the analysis being the work of parties of reputation:

Hydrogen.....	64.66	Oxygen.....	41
Marsh gas.....	24.73	Nitrogen, estimated.....	1.31
Olefiant gas.....	4.81	Ammonia, etc.....	.37
Carbonic oxide.....	2.72		
Carbonic acid.....	.19		100.00
Sulphureted hydrogen.....	.80		

Where does the oxygen yielded by the water go to?

As interested parties are exerting themselves to an unscrupulous degree to cast discredit upon the Lowe process and some of the gentlemen connected with it, you will pardon me for saying that men of science or reasonable honor will appreciate the fact that the new system does not rest upon any theories which the subscriber or any one else may present, but upon the facts which it works out. These happily are creditable and resist attack.

Let those who are so ready to criticize my explanation of certain facts offer a better one.

Respectfully,

G. S. D.

CLEVELAND (OHIO) COAL AWARD.—The Committee on Public Buildings has authorized a contract with W. R. Gerrard for furnishing coal at the City Hall at \$2.86 per ton for Massillon lump and \$1.67 for Massillon slack.

SUBSTITUTION OF PETROLEUM FOR GAS IN ENGLAND.—The London Mining Journal says: "It has been decided by the Romford Local Board of Health to decline the renewal of their contract with the Romford Gas Company for lighting the public lamps, and preparations are being made for lighting the town with petroleum. It is anticipated that the new oil lamps will be ready for use in the second week in September, and that a saving of £100 per annum will be effected by the change from gas to petroleum."

HYDRAULIC MINING IN CALIFORNIA.*

By Aug. J. Bowie, Jr., A. B., Mining Engineer.

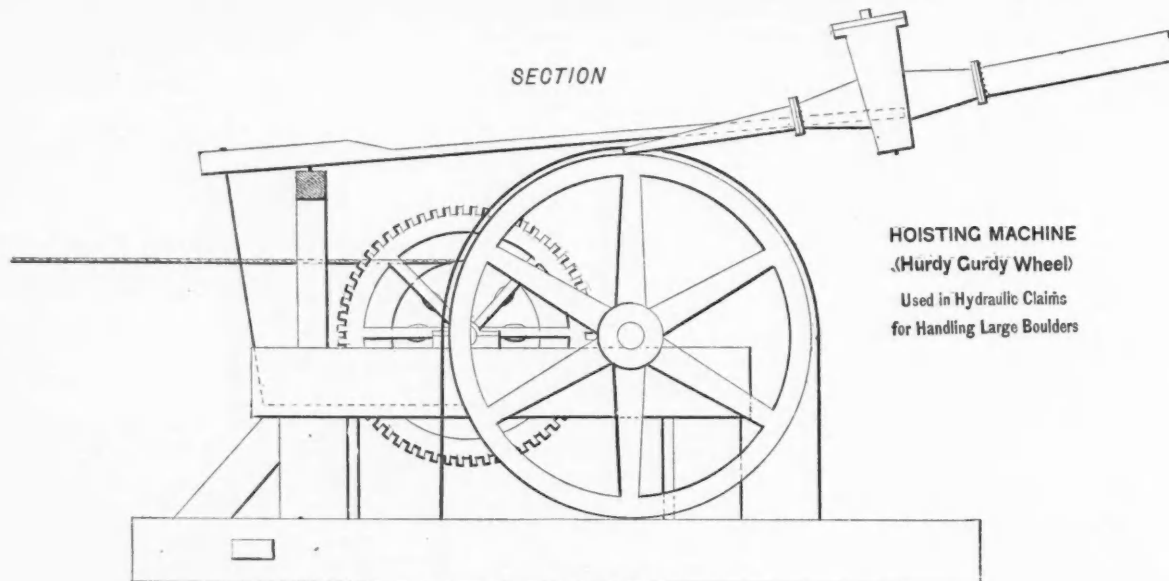
(Continued from page 171.)

HYDRAULIC WASHING.

The tunnel or opening for the sluices having been completed, the sluices placed in position, lined, and riffles set, water is turned on in the pipes and work commences. The first work is started near the head of the sluice, and the mine

CONTINUOUS WORK—GROUND SLUICES.

In well conducted claims the washing should be continuous, and no water allowed to run to waste. It is, therefore, requisite to have several faces or openings, so that the water can always be used as may be necessitated from time to time, whilst the cuts are being advanced and the sluices lengthened. These cuts or "ground sluices," as they are called, are mere trenches made in the bed-rock towards the face of the bank "hydraulicked," for the purpose of collecting the water and material, conveying them to the sluices. As a protection against thieves the sluices of claims worked intermittently are run full of gravel before turning off the water.



HOISTING MACHINE
(Hurdy Gurdy Wheel)

Used in Hydraulic Claims
for Handling Large Boulders

opened from that point. As the banks are washed away, the bedrock cuts are driven towards the face of the work, and the sluices are advanced as required.

To cave the banks, one pipe is kept playing on the lower part of it, on an obtuse angle, cutting out the gravel, and a second stream of water is directed from another pipe on the opposite side, forming a cross-fire, which materially aids the undermining. Any surplus of water not used in the pipes is allowed to run over the banks. In well-regulated works all the water should be used through pipes, and none allowed to waste into the claim. When the dirt caves readily, one pipe should be employed to do the cutting, and the second pipe should be manipulated clearing away the debris caving.

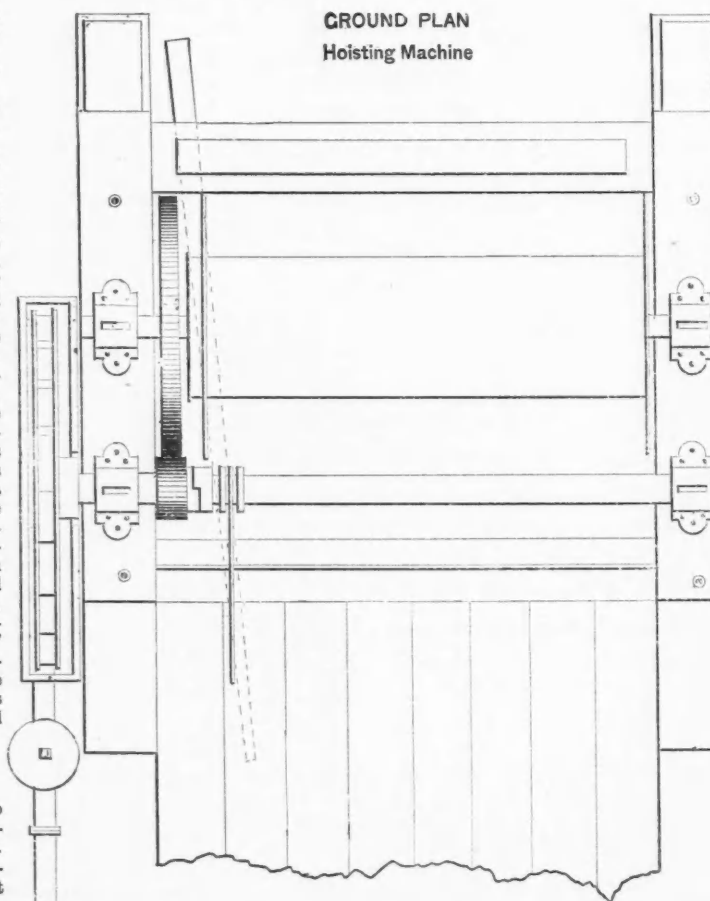
In working a claim, the face of the bank should be kept square. Advantage should be taken of the corners when left, and under all circumstances avoid working into what is called a horse-shoe form. If the banks are kept square, more work can be accomplished in less time, at less expense, and with fewer accidents. On the other hand, where a cut is pushed rapidly ahead, the work not squared, the men at the pipes soon stand encircled with high banks, "hydraulicking" can no longer be prosecuted to advantage, and the lives of the miners are imperiled. The majority of accidents arising from caves have been caused by this style of work.

HIGH BANKS.

Where the banks are very high, to mine to advantage it is advisable to hydraulic the deposit in two benches. Banks over 150 feet in height are dangerous to work as a single bench. At North Bloomfield and at Smartsville, they are working single benches 250 feet high. When a cave is coming, to avoid the sliding of the great detrital accumulations, the water should be turned away from the falling masses, and the dirt will not run any distance; but if it is allowed to remain on the bank, a great rush of water and debris ensues, and the men at the pipe have frequently to run for their lives. Such occurrences, arising either from carelessness or accident, cause a loss of time, and frequently entail damage to the pipe and machines.

Caves, when practicable, are generally made towards evening, and the night shift runs them off. Locomotive reflectors or fires of pitchwood are used to illuminate the banks during the night. The introduction of the electric light may ultimately be found serviceable.

* A paper read before the American Institute of Mining Engineers, at the Wilkes-Barre meeting, May, 1877.



LENGTH OF RUN.

The length of runs in gravel claims is dependent on circumstances. Some claims clean up every twenty days or month, others run two or three months, whilst some only clear up every season. In point of economy, the fewer the better.

BLASTING.

Where the ground is very hard, recourse is had to blasting. For this purpose a small powder drift is run in on the bottom from the face of the bank a given distance, proportionate to the ground to be blasted. From the end of the straight drift a cross drift forming the letter T is driven. As, for example, in hard cement like at Smartsville, with an eighty foot bank, in a case where the ground is ordinarily bound, a drift is run in at the bottom of the bank, say eighty-five feet long. At the end of it cross drifts are run out respectively forty-five feet in length. Forty feet from the face of the bank two similar cross drifts are also driven. From the ends and center of each cross drift two small "lifters," as they are called, are run out at right angles, extending respectively half way between the cross drifts and the face of the bank. These places are then filled with powder, which, in such ground as they have in that locality, would require from 450 to 500 kegs.

The heads of several of the kegs being removed, the main drift is tamped, and the powder is exploded by means of an electric battery or fuse.

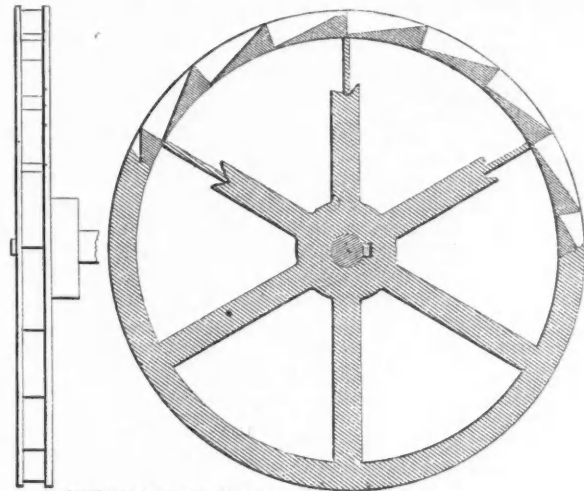
In large blasts several cross drifts may be required, and in such cases it is customary to fire the powder simultaneously in several different places by electricity. The quantity of powder used is determined by the position, character, and height of the bank, a

sufficient quantity only being taken to shatter it. In some places with lighter material two or three hundred kegs of powder will easily do the work that five or six hundred barely accomplishes in heavy cement. At Blue Point a blast of 2,000 kegs was exploded. At the Enterprise Mine, 250-foot banks, a blast of 1,700 kegs was fired. The powder is of the ordinary blasting quality. For destroying large pieces of lava, pipe-clay, boulders, trunks and stumps of trees, giant powder cartridges are found very efficient.

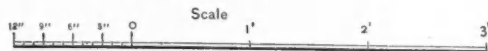
It is customary in certain districts to wash off the top or lighter gravel, and subsequently blast the bottom cement. For this purpose shafts fifteen to twenty feet deep, as may be demanded, are sunk, and a small chamber is excavated in the bottom of them. The chamber is charged with five or six kegs of powder, tamped, and then exploded by electricity. There is no doubt that in general there is a great waste of powder in bank blasting. The subject is worthy of investiga-

tion, and there is undoubtedly a field for improvement, by the reduction of the costs to a minimum.

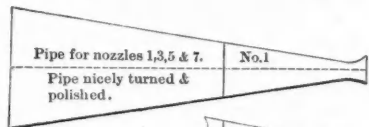
The object which it is desired to obtain by blasting is to thoroughly shatter



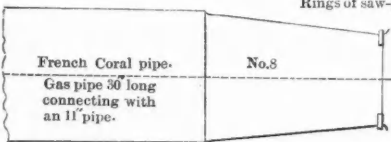
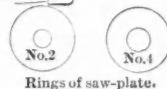
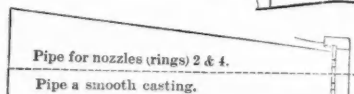
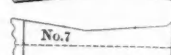
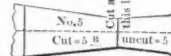
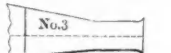
HURDY GURDY WHEEL



the material, i. e., separating rock and cement, so as to facilitate its washing, thus insuring the earliest separation of the gold, by enabling the bulk of the precious metal to come in immediate contact with the quicksilver in the head of the sluices, and affording every opportunity for the most complete scouring, and securing of the eroded gold particles.



Scale of 1/8 -



HURDY-GURDY WHEEL.

As the hurdy-gurdy wheel is the outgrowth of hydraulic mining, the following table showing its efficiency may to some be interesting.

EXPERIMENTS WITH HURDY-GURDY WHEEL, AT NORTH BLOOMFIELD.

The wheel was 18 feet in diameter on outside, and 17 feet 4 inches in diameter to inner line of buckets (17 feet 8 inches in diameter at center line of buckets). The buckets were 4 inches deep, with flanges on each side.

The work done was measured by a Prony dynamometer, carefully made.

The head given shows the real head in feet at the point of discharge; that is, the head due to a discharge from a pipe of infinite size.

Description of Nozzle.	Diameter of Nozzle in Feet.	Head in Feet at Nozzle.	Discharge of Water per Second in Cubic Feet.	Velocity of Water due to Gravity.	Actual Velocity of Water at smallest diameter of Nozzle.	Speed of Wheel at center of buckets when running light.	Highest Horse-Power developed.	Ratio of work done to Theoretical Power of Water.	Speed of Wheel at center of buckets when giving most work.	Number of Nozzles. See sketches.
Nozzle tapered.	.0531	322'3	.323	144'0	145'8	82'8	3'8	.318	48'8	1
Ring.....	.0597	316'3	.240	142'6	85'7	76'4	2'7	.312	44'8	3
Nozzle.....	.0850	312'1	.759	141'7	131'7	93'6	11'7	.437	57'1	3
Ring.....	.0847	312'6	.511	141'8	90'7	.....	7'5	.414	54'7	4
Nozzle.....	.0850	312'2	.509	141'7	90'3	90'4	.....	.423	57'3	5
Nozzle tapered, uncut.....	.0868	316'1	.813	142'6	137'4	.....	11'3	.387	59'8	5A
Nozzle.....	.1017	317'9	1'111	143'0	136'8	.....	15'9	.396	66'1	7
Nozzle.....	.1017	315'6	1'110	142'5	136'7	95'2	.....	.413	58'2	7
Nozzle cut off..	.0868	332'6	.831	140'2	140'4	.....	13'0	.413	58'2	5B
		335'9	.833	147'0	140'8	98'5	.....	.....	.....	5B

An experiment at the Empire Mill, French Corral, was made under the following circumstances, giving the annexed results.

Ten stamps, weight of each 693 1/4 lbs. Drop, 768 feet. Speed of stamps, 62.2 drops per minute. Work done by 91.68 cubic feet of water. Head, 130.1 feet. Size of wheel, 13 1/8 feet outer diameter. Inner diameter, 12.58 feet to center of bucket. Size of buckets, four inches wide and six inches deep, set ten inches apart. Water conducted to wheel through an eleven-inch pipe 866 feet long. The wheel was direct on the cam shaft, single cams used. The mill crushed sixty tons of gravel in twenty-four hours; 1/4 inch screens used.

Description of Nozzle.	Diameter of Nozzle in Feet.	Head in Feet at Nozzle.	Discharge of Water per Second in Cubic Feet.	Velocity of Water due to Gravity.	Actual Velocity of Water at smallest diameter of Nozzle.	Speed of Wheel at center of buckets when running light.	Highest Horse-Power developed.	Ratio of work done to Theoretical Power of Water.	Speed of Wheel at center of buckets when giving most work.	Number of Nozzles. See Sketch.
Ring.....	.1823	130'1	.528	91'4	58'5	.....	10'0	.445	41'0	8

The head at French Corral was the height of the water in the pen stock above the nozzle, no allowance being made, as was the case in the Bloomfield experiments, for loss of head by friction in pipes and some leakage.

TO BE CONTINUED.

MINING NEWS.

Staff Correspondence of the Engineering and Mining Journal.

COLORADO.

The old Nederland Amalgamation Works is being fitted up for concentration works, to handle the ores from the Trojan and Boulder County lodes. These properties, which are adjoining claims on one and the same vein, show in the various openings upon the enormous bodies of \$40 ore, consisting of both silver and gold bearing minerals, and are amply capable of supplying a large mill. The new enterprise is one of the most promising in the State. If found successful, a number of mines around Nederland now lying idle will be opened. True vanners are to be used. The ores are mainly pyritous, in a gangue of quartz.

The Silver Queen Concentration Works at Georgetown, which has been idle for over a year, is now being fitted up for steady work, the owner having made satisfactory arrangement for a large ore supply, pending the further development of the New Boston property, for which the mill was especially built. The Silver Queen mill is one of the best arranged works of its kind in Colorado. It is fitted with crushers, rolls, and three sets of water-jigs, and is capable of handling 30 tons daily, if not more.

A lixiviation works of ten tons capacity is to be built this fall in Cement Creek, San Juan. Mr. Dow, the originator of the enterprise, is the owner of a number of fine lodes in the vicinity, and we are informed by him that the district is cut by a large number of fine silver-bearing ledges, carrying good milling ore. The system of reduction to be employed is similar to that in use at the West Denver Reduction Works.

At the smelting works in Black Hawk and Golden, it is reported that the ore supply is largely in excess of what it has been during the same months of previous years. The increase is due to an unusually heavy production from Clear Creek and Boulder County. In Gilpin County, the quantity of smelting ore raised is about the same as usual, but the milling produce is steadily increasing, and is now amounting to about 4,000 tons weekly, from which about \$50,000 in gold is taken. The Boston and Colorado smelting works is erecting a new furnace, which will raise the capacity to 60 or 70 tons daily, and has also begun the erection of another large stone building. It is doubtful if the works removes this year, as has been expected. The Golden works is having a steady supply of ore from all parts of the State, and is doing a regular and fine business.

The following, regarding the Specie Payment and the Comstock mines, we condense from the Register:

"The Specie Payment, on the dividing ridge between Virginia Cañon and Fall River in Clear Creek, was discovered by Messrs. Carr, McKee & Orr in June, 1875, and was sold by them to the Sunshine Company, an association of Troy (N. Y.) capitalists, in November of the same year, for the sum of \$12,000. The original owners sunk a shaft on the lode—which is at an elevation of nearly 9,500 feet above sea level—and obtained 20 and 25 ounces of gold per cord. After the shaft had reached a certain depth, a tunnel was started in on the vein, the steep slope of the mountain being admirably adapted for such work. The same rich character of ore was found as in the shaft. The product of the mine was taken to Black Hawk for crushing, and yielded at Kimber's mill from 6 to 25 ounces per cord. The highest run exceeded 29 ounces per cord, or \$470. The vein continued from 2 to 6 feet in width, and there was very little waste rock between walls.

"At Idaho Springs a mill and raceway were built, under the supervision of George Briggs, and completed June 1, 1877. It contained 15 stamps, and cost something over \$5,000, outside of raceway and dam.

"Up to June the company had sent about 90 cords of ore to Black Hawk, from which about 1,000 ounces of gold were received, worth from \$16 to \$16.25 per ounce. After that the ore went to the company's own mill at Idaho, where nearly 100 cords have been handled. But the company sent men here to run the mill who knew nothing of milling. The mill returns showed an unaccountable falling off, and finally dropped down to less than three ounces. A new and experienced man was put in charge of the mill, and the yield was again brought up to eight ounces. It is thought that this is about the present return of the entire mine. The vein is unusually flat, having a pitch of but little over 30° from the horizontal. The great width between walls, generally five or six feet, renders locomotion very easy, and the pitch furnishes an excellent slide from the stopping grounds above down to the tunnel level. The latter is supplied with an iron track for its entire length, 320 feet, and the ore is conveyed to daylight in an iron car of improved pattern. The old shaft is 106 feet deep.

"Fifteen men are employed, at \$2.50 per day, and from eight to ten cords of ore are mined and milled weekly. The ore weighs about seven tons to the cord. A small amount of smelting ore has been sold. The lower price received was \$171 and the highest \$188 per ton. The mill will probably soon receive an addition of ten stamps.

"The Comstock Mine.—This mine continues to improve in the amount of its ore deposits as development progresses, until it is now one of the most profitable pieces of property in the State. The 'chimney' that continued from the surface downward has opened out along the course of the vein east and west into an ore

body of great extent. The ore from the surface downward in this part of the mine has yielded from 8 to 20 ounces of gold per cord. Recent workings show both walls of the vein to be regular and well-defined. Two levels have been driven easterly, one at a depth of 130 feet, which is now 160 feet long, and one 40 feet further down, which is 70 feet in length. Here the ore is of poorer quantity than further east, its yield being generally about five ounces, but sometimes as low as three.

"In the main ore body the crevice has sometimes reached a width of 15 feet. The pay vein or ore body varies from 2 to 10 feet in width. In the winz from the 130-foot to 170-foot level it averages five feet, and in the levels about the same. The vein matter now shows seams of iron, galena, and iron clay. It was so soft for the first 100 feet or more that no blasting was required. It is still so beneath in the center of the vein for a width of from six inches to five feet, but at the sides blasting is required.

"The superintendent's reports from July 14 to August 18 give 71.25 cords of ore milled; yield, 607.05 oz. gold; receipts, \$9,747.28; expenses, \$4,329.14; profits, \$5,418.14. No other mine in Gilpin County is showing as large a percentage of profit. The average yield was very near 8 1/4 oz. per cord, or about \$16.80 per ton. So far no drifting of any amount has been done west of the shaft, but as the lower workings are now below the level of the gulch, work can be prosecuted in that direction as well as easterly into the hill. Thirty men are employed.

"One year ago this vein, that underlies the streets and buildings of Central City, was unknown. Accident led to the discovery of a pocket of rich dirt by Mr. Jenkins in the rear of his house last October. Thinking he had pretty nearly exhausted the pocket, he sold to E. D. Fritz and associates. They continued to sink, and took from the rich chimney \$30,500 from October 28 to April 10. Of this over \$20,000 was profit, with an average of over 10 oz. of gold per cord. Then Messrs. Einstein, Tyler, and associates, of St. Louis, purchased the property, the association being known as the Comstock Company."

On the Polar Star about 40 men are working. The company has its hoisting and pumping engine set and in working trim, and has recently put in a Sturtevant blower to improve the ventilation. Twelve men are working for the company, the balance being leasers, who are working in the various stopes.

The rich ore body of the Emma Mine, though now drifted upon for 170 feet, still holds out finely. The mine still is worked by the cross-cut from the Polar Star, but will shortly be opened by an adit.

The Cashier Mine, Montezuma, is engaged in shipping a 100-ton lot of ore to Georgetown to test its value.

The *Silver World* says: "Van Gieson's lixiviation works started up last Wednesday and is now in full blast, all the new machinery having arrived. It is receiving a greater quantity of ore than ever before, and this already popular process seems to be rapidly gaining in public favor. There are now at the works, and arriving, 5 tons of ore from the famous Bill Young lode, none of which runs under 500 ounces, and much of which reaches 2,500 oz. silver to the tons; four tons from the Dolly Varden, running 800 oz. mill assay; 12 tons from the Wheel of Fortune of its usual high grade, and seven tons from the Trout and Fisherman, which averages 250 oz.

"McNutt and Howard have just started work again on their tunnel on the Poughkeepsie, in Poughkeepsie gulch, and are sacking ore from the tunnel. They have a mammoth vein, thirty feet wide, with three-foot pay-streak, galena rich in gray copper, sulphurets, and pyrites."

From the *Sentinel* we learn that a new channel has been struck in the Mills & Hodges placer mine at Alma, during the week. For a long time the supposition has been prevalent among the owners of this valuable property that an old channel in the rear of the grove would be struck, and it is now supposed that the edge of this pre-adamitic channel has been encountered within the last ten days. The gold obtained thus far is coarse, and to a considerable extent differs entirely from that found in the gravel ridge between the present and the old channel. Several nuggets from half an ounce and upwards have been found, and the clean up is larger than any which has hitherto been made in the mine.

A new body of rich ore has been struck in the Dolly Varden which promises to be more extensive than any yet found in this valuable mine.

The Gilman-Planet Mine at Geneva is now shipping its last year's production of ore to Georgetown. The average of 19 tons was 215 oz. per ton, and 50 per cent. lead. There is altogether about 40 tons. The mine is yielding handsomely.

The Pelican is yielding a fair amount of ore daily, from the labor of leasers mainly.

Developments on the Treeland (Trail Run) are going ahead rapidly and very satisfactorily. An immense body of \$60 ore has been uncovered in the long adit level of the mine, and continued working shows still more. The mine is liable to prove one of the finest in the State after a year more of the systematic development now being put upon it.

At the Pittsburg Mine (Empire) work has been temporarily discontinued until the side-track of the C. C. R. R. is put in. 100 tons of ore are on the dump awaiting shipment.

The Hukill is at present also shut down, but will be shortly reopened.

A third interest in the Pioneer (Empire) has been sold to Judge Rombauer, of St. Louis. A 15-stamp mill is to be put up immediately at the mouth of the mine.

NOTES.

OUTPUT OF THE ALABAMA COAL FIELDS.—The output of the coal fields of Alabama for this year shows a surprising increase over all previous returns. According to the *Montgomery Advertiser*, the Warrior and Cababo fields will produce twice as much as they did last year.

SENSIBLE CONCLUSION OF THE TUSCARAWAS VALLEY (OHIO) COAL MINERS.—At a meeting of the miners of the Tuscarawas Valley, held at the old furnace bank on the 20th ult., it was decided by a large majority not to strike. A permanent committee of six was appointed to adjust all future difficulties that may arise.

THE "HARD GLASS" manufactured by Siemens, of Dresden, by means of hydraulic pressure, is said to be stronger than Bastie's glass, in the proportion of 5 to 3. Its fracture, according to the *English Mechanic*, is fibrous, not crystalline. Besides being stronger, it is also cheaper than Bastie's "tempered" glass; and, unlike the latter, sheets of the Dresden glass can be cut to any size with the diamond.

OUR ARABLE LAND.—Major Powell, in charge of the Geological Survey of the Territories, recently made a statement that there is but comparatively a small area of arable land now owned by the United States. This statement has been frequently controverted. Major Powell is preparing for Congress, at the direction of the Committee on Public Lands, an accurate statement of this question, in which he will maintain his assertion.

MINERALS IN THE TRANSVAAL.—The Transvaal, the State recently annexed by the Britishers, is a country larger in area than France, and more or less settled by a thinly-scattered community of farmers. It has two townships of some importance from a colonial point of view, Putschefstroom and Pretoria, besides smaller villages. It has splendid pastoral resources, fine agricultural capabilities, varied though undeveloped mineral wealth, in gold, lead, coal, cobalt, iron, and copper, and a climate that can scarcely be surpassed. The accession of so valuable a territory forms an event of very high imperial importance.

RUTHENIUM.—MM. St. Claire-Deville and H. Debray have recently reported on the physical and chemical properties of ruthenium. They find that the metal forms an oxide RuO₂, thus differing from osmium. By fusing the pure metal with potash and saltpeter, then saturating the rutheniate thus formed with chlorine, and distilling in a current of the gas at about 80° C., they obtain the tetra-oxide RuO₄ in yellow crystals, which, when reduced, yields the pure metal. The metal they obtained by purification from its alloy with zinc was found to have a density of 12.261 at 0°. They also obtained a compound, Ru₂K₂O₈, in black crystals, on saturating the rutheniate of potash with chlorine. For the analysis of ruthenium ores, the process they employ is based on the foregoing remarks. After the fusion of the ores with saltpeter and potash, the whole mass is distilled with chlorine, the excess of gas, together with the RuO₄, being absorbed by solution of potash. The potash solution is then treated with alcohol, which precipitates the ruthenium as oxide, and this is finally reduced to the metallic state with hydrogen.

SEBASTIN—A NEW SAFETY DYNAMITE.—An improved nitroglycerine compound has been invented by Mr. Gustaf Fahnehjelm, of Stockholm, the chief modification being that the second main ingredient is charcoal produced from a special wood, and selected and prepared in such a manner as to be able to absorb and solidify the greatest possible quantity of nitroglycerine. In order to render the combustion more complete, and to augment the rapidity of the explosion, a small quantity of nitrate of potash, or other suitable salt, is added to the mixture of the two ingredients above named. The composition of the new sebastin depends upon the objects for which it is to be used, and the effects intended to be produced. The strongest compound, and even in this there is stated to be no risk of the separation of the nitroglycerine, is composed of 78 parts by weight of nitroglycerine, 14 of the wood charcoal, and 8 of nitrate of potash; and when less power is required the proportions are varied, the second quality consisting of 68 per cent. by weight of nitroglycerine, 20 of the charcoal, and 12 of nitrate of potash.—*London Mining Journal*.

THE CLEVELAND (OHIO) COAL AND IRON TRADE.—The *Herald* of the 20th ult. says: "The Lake coal trade so far this season has amounted to about 200,000 tons, which, at the average value of \$2.00 per ton, would amount to \$580,000. The ore received is about 275,000 tons, which, at \$5 a ton for specular, soft hematite, and magnetic, would amount to \$1,375,000, making an aggregate business in these two articles of \$1,955,000. The coal shipments should have been larger, but the difficulties at the mines and with the railways have cut down the shipments from 50,000 to 75,000 tons, which, it is hoped, will be made up before the close of the season. The whole amount of coal shipped for the season last year was 519,601 tons; and the year previous, 671,955 tons. So it will be seen that the port is far behind what it should now be in this article of trade. Of iron ore but little more can be expected, as the contracts for delivery are now nearly completed, and mining has been virtually suspended for the balance of the season. Besides, the receipts of ore last year, including Lake Champlain, were but 320,811 tons, and the year previous 361,461 tons, showing that we have our full proportion so far this season, even though no allowance is made for the larger quantity which has been going to Ashtabula, and which formerly passed through this channel."

THE PERUVIAN NITER-BEDS.—On the Pacific coast of South America, extending from the fourth to the fortieth degree of south latitude, about 2,400 miles along the slope of the Andes to the sea, in Bolivia, Peru, and part of Chili, there has been found a line of deposits of sodium nitrate, the "Peruvian niter." The beds are of variable thickness, covered by from one to ten yards' depth of earth and half-formed sandstone. The dry soil of the most of this rainless country is pervaded, in some degree, with this deposit. The mummied remains of the old Peruvian people are embalmed with it by the earth in which they are buried; and its crystals glisten on those ghastly relics which were presented in the Peruvian department of the Centennial Exhibition, and those brought to this country by Dr. Steere. It has been estimated that in the Province of Tarapaca, within fifty square leagues, the quantity of the niter is not less than 63,000,000 tons. The appropriation of this vast resource has been taken up rather slowly, but has much increased for ten or twelve years past. Vessels laden with it go to the coasts of manufacturing countries. At Glasgow the works devoted to the production of ordinary saltpeter from the niter of Peru extend over acres of ground. In 1868, 100,000,000 pounds were used in Great Britain. As yet it has been applied to the nourishment of crops only to a limited extent. But this seems to be its chief destination, and for this use it lies in the earth, a vast mine of wealth, for the disposal of coming generations. When multiplied population puts the sustaining power of the earth really to the test, this fund of sustenance on the Peruvian coast must come to outweigh in value the gold and silver mines of the Californian coast.—*Popular Science Monthly*.

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ASSAYS.

LXVIII. LONG & DERRY.—Specimens contained silver as follows: No. 1, 651.99 oz.; No. 2, 280.67 oz.; No. 3, 177 oz.

LXIX. E. R., North Carolina.—Specimens contained gold as follows: No. 1, 5.61 oz.; No. 2, 2.08 oz.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines. Comparative Statement for the week ending Sept. 1, and years from Jan 1st.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.....	.....	1,283,899	29,232	1,149,947
D. L. & W. RR. Co.....	*3,247	1,311,352	38,833	944,613
Penn. Coal Co.....	16,420	702,902	30,321	623,388
L. V. RR. Co.....	2,588	591,234	13,764	613,779
P. & N. Y. RR. Co.....	.....	32,931	.....	17,488
C. RR. of N. J.....	.....	868,101	31,251	775,105
Penn. Canal Co.....	2,196	226,093	927	239,246
	24,460	5,014,512	144,328	4,363,566
Lehigh Region.				
L. V. RR. Co.....	54,602	1,960,916	24,355	1,570,492
C. RR. of N. J.....	9,597	923,152	25,312	795,071
D. H. & W. B. RR.....	634	13,719	1,182	28,479
	64,833	2,897,787	50,849	2,393,952
Schuylkill Region.				
P. & R. RR. Co.....	185,054	4,176,561	77,776	2,631,862
Shamokin & Lykens Val.	.....	401,721	12,272	512,725
	185,054	4,578,282	90,048	3,144,587
Sullivan Region.				
Sul. & Erie RR. Co.....	731	8,982	99	27,599
	731	8,982	99	27,599
Total	275,078	12,499,563	285,324	9,929,704
Increase.....	.....	2,569,809	.....	.....
Decrease.....	10,246	.....	.....	.....

* From August 13 to August 31.
 † This report was not received this week.

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

Receipts and shipments of coal at Chicago, Ill., for the week ending Sept. 7, and year from January 1:

	Week.	Year.
	Tons.	Tons.
Receipts.....	34,820	1,047,570
Shipments.....	9,880	245,410

Shipments of coal at Pictou, N.S., for the week ending Sept. 5 and year from January 1:

	Week.	Year.
	Tons.	Tons.
To Canada.....	6,704	34,839
" United States.....	.....	17,225
" Other Provinces.....	3,404	41,593
Total tons.....	10,108	93,662

The shipments of coal at Cleveland, Ohio, for the week ending Sept. 1 were as follows: shipped coastwise, 8,257 tons; total for year, 168,272 tons; foreign shipments, 2,119 tons; total for year, 55,002. Total of coastwise and foreign shipments for week, 10,449; for year, 223,275.

The Exports of Coal from Baltimore for the week ending Aug. 31 were 50 tons, and since January 1st, 22,094 tons as against 22,589 tons for the corresponding time in 1876.

Receipts of Coal at Boston, for the week ending Aug. 31 and year from Jan. 1.

Tons of 2,240 lb.	1877.		1876.	
	Week.	Year.	Week.	Year.
From				
Alexandria and Georgetown	.....	40,564	3,592	43,356
Philadelphia.....	8,679	422,139	12,319	338,131
Baltimore.....	5,000	94,333	5,065	98,997
Other places.....	4,044	187,756	11,483	184,068
Great Britain.....	.....	1,456	.....	4,018
Nova Scotia.....	2,431	20,478	1,135	12,935
Total.....	21,634	766,816	33,594	681,595

Perth Amboy business:
 Received for the week..... 16,762 Tons.
 Shipped for the week..... 26,092
 On hand Sept. 1..... 55,768

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania, Railroads amounts to 199,453 tons, as compared with the corresponding period in 1876.

The Receipts of Coal at Rondout, N. Y., by the Delaware & Hudson Canal for the week ending Sept. 4 were 121 boats, carrying 15,238 tons.

Belvidere Delaware RR. report for week ending Sept. 1.

	Week.	Year.	Week.	Year.
	1877.	1876.	1877.	1876.
Coal for shipment at Coal Port (Trenton)	.....	12,544	163,559	.....
" " South Amboy.....	5,856	366,554	291,567	.....
Coal for distribution.....	3,589	114,573	101,538	.....
Coal for Company's use.....	910	45,669	40,334	.....

The production of Bituminous Coal for the week ending Sept. 1 was as follows:

Tons of 2,000 lb., except where otherwise designated.		Week.		Year, Tons.	
Cumberland Region, Md.					
Cumberland Region, Md.....		54,096	.....	911,855	.....
Barclay Region, Pa.					
Barclay RR. tons of 2,240 lb.....		3,379	.....	215,029	.....
Broad Top Region, Pa.					
Huntingdon and Broad Top RR.....		4,036	.....	92,761	.....
*East Broad Top.....		1,327	.....	33,621	.....
Clearfield Region, Pa.					
*Snow Shoe.....		429	.....	25,454	.....
*Tyrone and Clearfield.....		22,883	.....	849,242	.....
Allegheny Region, Pa.					
*Pennsylvania RR.....		3,932	.....	123,485	.....
Pittsburg Region, Pa.					
*West Penn. RR.....		1,963	.....	113,645	.....
*Southwest Penn. RR.....		751	.....	25,117	.....
*Penn & Westmoreland gas coal, Pa. RR.....		1,148	.....	409,865	.....
*Pennsylvania RR.....		7,773	.....	217,165	.....
*For week ending Aug. 28.					
The Production of Coke for week ending Aug. 28.					
Tons of 2,000 lb.		Week.		Year.	
West Penn. RR.....		1,256	.....	38,964	.....
Southwest Penn. RR.....		12,690	.....	374,584	.....
Penn & Westmoreland Region, Penn. RR.....		103	.....	42,850	.....
Pittsburg, Penn. RR.....		1,490	.....	73,953	.....
Total.....		15,539		539,351	

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Sept. 7, 1877.
Anthracite.

As a liberal supply of coal is now guaranteed, buyers are not so anxious, and trade is steadily becoming quiet. Of course those who have coal for sale say that they are crowded with orders and have all and more than they can do; but this is generally the result of business secured at an earlier date, and not new business at the advanced prices. The companies who are mining may receive one benefit from marking up the price of coal: they may make the public think that prices under those now quoted are low, and by this means revive contracts made at rates between the present ones and those ruling when the strike came on, and in so doing dispose of enough coal to fairly maintain present prices, while at the same time disposing of a certain quantity at or nearly full rates. Coal would not have been called for so liberally if there had not existed numerous contracts at very low prices. The contractors finding prices advanced saw large profits in taking the coal they had contracted for, and hence have been sending in their orders quite freely, while had they been compelled to purchase at the ruling rates they would only have called for such quantities as would supply their pressing necessities. Many dealers have failed to fortify themselves with contracts, and it is supposed that they will have to come into the market for supplies. This belief, however, is erroneous, for those who are securing coal under contracts will naturally absorb the majority of the trade at prices that would be unprofitable to dealers purchasing at the prevailing quotations, thereby reducing the requirements of those who did not contract earlier. From the present outlook business at existing prices will be quieter in a week or ten days hence.

With the exception of the Lehigh & Wilkes-Barre Company's mines at Mauch Chunk, the whole of the Lehigh region has resumed work at prices that were current in May last. The Schuylkill region is working in full blast. In the Wyoming region, however, there are no indications of resumption. Good local authorities say that from the present outlook it may be several months before work is resumed. However, there is nothing so uncertain as the length of a miners' strike.

In the Schuylkill and Lehigh regions there does not appear to be much, if any, surplus of labor; while in the Wyoming region there has been fully twice as many men as were required. This is the source of trouble in this region, and it is but natural to offer the simple suggestion to employ only such men as are required. With full employment, labor in this region would secure very good pay at present wages, and, in fact, should even submit to a further reduction. To discharge so large a force at one time, with no chance of those so discharged securing employment elsewhere, has been considered by the companies as an act quite inhuman and one that would bring great misery. But with all these considerations for their employees the men voluntarily stop work for weeks with the hopes of forcing the companies to paying this large surplus of labor wages nearly equal to what they should receive were they fully employed. This is a question that must receive the most serious attention, and, come what may, the surplus of labor in the anthracite coal regions must gradually be worked off into other mining districts or other industries.

The present strikers may in time force the companies into submission to their demands. If they do they will only hold the field for a short time, for when work is once more resumed in all the regions there will be a steady decline in the price of coal, and as soon as stocks have accumulated to a liberal extent the companies will demand a reduction fully equal to the increase that may be given; and in case it should not be submitted to, another suspension would take place. While the miners in the Wyoming region are standing out for what they term their rights, they are losing ten times as much wages as they are likely to receive by an advance, while they furnish steady employment to miners in other districts who are working for even less wages. It is to be hoped that the men may have these facts impressed upon them, and that they may not be led to believe that the present prices of coal are to be permanent, or that there is as much in these prices as appears.

The following Schuylkill collieries having been drawn to furnish prices of coal for fixing wages to be

paid in August, make the following returns as the average of their sales in August, 1877: Mine Hill Gap, P. & R. C. & I. Co., \$1.60; East Mahanoy, Focht & Whitaker, not working; Boston Run, P. & R. C. & I. Co., \$1.70; Bear Run, Wiggan & Tribbles, \$1.64; Merriam, P. & R. C. & I. Co., \$1.68. The average of these prices is \$1.64, and the rate of wages for August is, therefore, 28 1/2 per cent. below \$2.50 basis.

Gen. Pleasants, Chief Engineer of the Philadelphia & Reading Coal & Iron Company, in a letter dated September 1, to the district superintendent says:

"I telegraphed you yesterday that the basis reduction from August wages on August price of coal was 28 1/2 per cent.; but that President Gowen had decided that only 20 per cent would be taken off. On the July price of coal the basis reduction would have been fully 40 per cent., so that Mr. Gowen has really made an advance of 20 per cent. to our men on their August wages, which amounts to something over sixty thousand dollars on our August pay rolls. On the July wages we made an advance of 7 per cent. to our men, the basis reduction being 37 per cent., whereas we took off only 30 per cent. This amounted to over eighteen thousand dollars on our July pay rolls. On the June wages we made an advance of 3 per cent., the basis being 33 per cent., but we took off only 30 per cent. This amounted to nearly eight thousand dollars. These three advances by the company to its men amounted to nearly eighty-six thousand dollars. There is every prospect of the price of coal continuing to advance, so that if our men continue doing their duty to themselves and to the company, and remain steadily at work, they will reap their full share of the advance."

There have been no changes in prices, except with the Philadelphia & Reading Coal & Iron Company, for New York, and Northern and Western deliveries. The present quotations of this company for white ash coal, delivered alongside here, are as follows:

Lump.....	\$3 95	Stove.....	\$4 45
Steamer.....	3 95	Chestnut.....	3 95
Broken.....	4 20	Chestnut No. 2.....	3 70
Egg.....	4 20	Pea.....	2 45

These prices are 95 cents per ton higher than f. o. b. at Philadelphia.

Our table of production for last week is not quite full. So far as reported, however, there was an increase over the previous week, and full reports would probably show an increase over the corresponding week of last year. The total increase from January 1 to September 1, as compared with the like period of 1876, was 2,569,859 tons.

Bituminous.

But little is to be said about this class of fuel. Cumberland is hard at work, but last week's report shows a falling off in production as compared with the previous one. The companies are as yet busy filling the demands of those who had contracted with them previous to the strike. The Clearfield region is at work again. The production shows some loss from the late strike, but for the year in comparison with 1876 is still ahead. Prices are still hard to determine and much a matter of negotiation.

New York.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240 lb.

Prices being merely nominal this week we omit them entirely.

Wholesale Prices of Bituminous Coal.

Per ton of 2240 lb.	At the Shipping Ports.		Alongside in New York.
	Westmoreland and Penn. at Greenwich.	Philadelphia.	
Philadelphia.....	\$4 70	\$5 50	
" " at S. Amboy.....	5 00	5 50	
Red Bank Camel Pa. at Philadelphia.....	8 00	8 80	
Youghiogheny, Waverly Co., at Balt.....	4 50	5 65	
Despard, West Va.....	8 50	6 00	
Murphy Run, West Va., at Baltimore.....	4 50	5 85	
Fairmount, West Va.....	4 40	5 70	
Newburg Orrel, Md.....	4 50	6 00	
Cannelton Cannel, West Va.....	.....	10 00	
" Splint " at Richmond.....	6 00	7 00	
" Gas Coal at Richmond.....	4 00	5 65	
Peytona Cannel W. Va. at Richmond.....	.....	10 00	

Manufacturing and Steam Coal's.

These are only nominal.

Foreign Gas Coals.

	Sterling.	Am. cur'y
Newcastle, at Newcastle-on-Tyne.....	8/6@10/6	5 50@6 00
Liverpool House Orrel, at Liverpool.....	45/	13 00
Ince Hall Cannel.....	35/6	18 00
" Gas Cannel.....	25/6	10@10 50
Scotch Gas Cannel, at Glasgow, nominal.....	25/	7 50
Gold.		
Block House, at Cow Bay, N. S.....	1 75	4 50
Caledonia, at Port Caledonia.....	1 50	4 25
Glace Bay, at Glace Bay.....	1 60	4 25
Lingan, at Lingan Bay.....	1 75	.....
International mines at Sydney.....	1 75	4 50
Pictou, Vale mines, at Pictou.....	2 15	4 75

Retail Prices in New York.

Table with columns for Anthracite (Grate and Egg, Stove, Chestnut) and Bituminous (Liverpool House Orrel, etc.) prices per 2000 lbs.

Baltimore.

Sept. 4, 1877. Specially reported by Messrs. E. STABLER JR., & Co.

Wholesale Prices.

AFLOAT BY CARGO PER TON OF 2,240 LB.

Table showing Lump and Steamboat, Broken, and Egg prices for Anthracite and Bituminous.

Lykens Valley Red Ash.

Table showing prices for Broken and Egg ash, with options for rail or wharf.

Bituminous.

Table showing prices for George's Creek and Clearfield bituminous.

Boston.

Sept. 1, 1877. The market is dull since the advance in prices. Stocks on hand are not large. Freight are firm and higher.

Coal freights from Philadelphia now rule at \$1.25; Baltimore, \$1.40@1.50; Alexandria and Georgetown, nominally, \$1.45@1.55; New York, \$1@1.10.

Table showing Broken wholesale prices for Anthracite, do. egg, do. stove, Cumberland, Clearfield, Westmoreland, and Caledonia.

Chicago, Ill.

Sept. 4, 1877. Specially reported by Messrs. RENO & LITTLE. The following are the prices to-day for coal:

Table showing prices for Lackawanna Stove, Chestnut, Grate and Egg, and various bituminous grades.

Cincinnati, O.

Sept. 4, 1877. Specially reported by the Consolidated Coal and Mining Co.

Table showing prices for Youghiogheny lump, Camden, W. Va., Peytona Cannel, Connelville coke, Youghiogheny coke, and Anthracite.

Hamilton, Ont.

Sept. 4, 1877. Specially reported by H. BARNARD. I beg to hand you state of our market corrected to date.

Table showing prices for Grate, Egg, Stove, and Nut for Anthracite and Bituminous.

Cleveland, O.

Sept. 5, 1877. Specially reported by Messrs. LAMBIE & BATES. Per ton of 2000 lbs. f. o. b. vessels.

Table showing prices for Brier Hill, Massillon, Hocking Valley, Mineral Ridge, Tuscarawas Valley, Columbiana, Nut coal, and Screenings.

Philadelphia.

Sept. 6, 1877. Specially Reported. The trade continues fairly active, but there is not the excitement which existed some time ago.

Table showing prices for Brier Hill lump, Massillon and Mineral Ridge lump, Straitsville Lower Vein, and Del Carbo lump.

Rich Hill lump, nut, Columbiana lump, nut, Lackawanna, Wilkes-Barre and Pittston egg and grate, stove, chestnut, Lehigh \$1.25 per ton higher.

Indianapolis, Ind.

Sept. 3, 1877. Specially reported by Messrs. COBB & BRANHAM. Wholesale on board cars, and retail delivered to consumers.

Table showing prices for White River, Brazil Block, Highland, Block coal, Block Slack, Broken, Egg, Lehigh Anthracite, and Retail prices for Sand Creek, White River, Brazil Block, etc.

Louisville, Ky.

Sept. 3, 1877. Specially reported by Messrs. BYRNES & SPEED. Below find latest quotations:

Table showing Wholesale and Retail prices for Pittsburg, Raymond City, and City Make Coke.

Montreal.

Sept. 3, 1877. Specially reported by Messrs. ROBERT C. ADAMS & Co. Scotch Steam, Pictou, Anthracite at retail, Egg, Stove.

Milwaukee, Wis.

Sept. 3, 1877. Specially reported by Messrs. R. P. ELMORE & Co. Retail price per ton of 2,000 lb. Anthracite, egg, chestnut, and stove.

New Orleans, La.

Sept. 1, 1877. Specially reported by Messrs. C. A. MILTENBERGER & Co. Coal on hand September 1; Pittsburg coal, 116 boats and 4 barges.

The coal market is somewhat stronger at this date. The stock on hand is small, being hardly sufficient for the demand until January 1, 1878.

Table showing prices for Pittsburg Coal (At wholesale, To steamboats, etc.) and Anthracite Coal (At wholesale, retail).

Virginia Cannel Coal.

Table showing prices for Virginia Cannel Coal (At retail) and St. Bernard (Ky.) Coal (To steamboats, families).

Philadelphia.

Sept. 6, 1877. Specially Reported. The trade continues fairly active, but there is not the excitement which existed some time ago.

The supply of vessels is good, and sales are steady at \$1.25 @ 1.20 to Boston, \$1.15 @ 1.20 to Providence, 80c. to Washington and Richmond. Unless the strike soon ends the production will now show a rapid decrease.

Pittston, Pa.

Sept. 4, 1877. Pennsylvania Coal Company's Coal in yard, ton of 2000 lb. Retail. Lump, Egg and Stove, Chestnut, Pea.

Richmond, Va. Sept. 4, 1877. Specially reported by S. H. HAWES, Dealer in Coal. Per ton of 2,240 lb. f. o. b. Kanawha Cannel, Coalburg Splint, Lewiston, Kanawha Gas Coal.

Sandusky, O. Sept. 5, 1877. Specially reported by C. E. BLACK, Agt. Con. Coal & Mg. Co. We quote coal on cars at Sandusky, as follows: Per ton of 2,000 lbs. Anthracite.

Table showing prices for Wilkes-Barre, Lackawanna, Lehigh, Massillon, Del Carbo, Hocking Valley, and Bituminous (Stratsville, Shawnee, Blossburg).

St. Louis, Mo. Sept. 6, 1877. Reported by JAS. J. SYLVESTER, Secretary of the Anthracite Coal Association.

Table showing Retail prices delivered for Anthracite (Lackawanna, Wilkes-Barre) and Bituminous (Blossburg, Pittsburg, Indiana Block).

San Francisco, Cal. From the Commercial Herald of Aug. 30, 1877. COAL—Imports from January 1 to Aug. 1:

Table showing Tons of Anthracite, Australian, Coos Bay, Cumberland, English, Chili, Mt. Diablo, and Vancouver Island.

Arrivals during the week have been numerous, and the market is glutted with foreign, causing unusual depression. The Carondelet's cargo of 1,800 tons Liverpool was placed prior to arrival at \$1 per ton more than it could possibly be sold for to-day.

Toledo, Ohio. Sept. 4, 1877. Specially reported by Messrs. GOSLINE & BARBOUR. We report prices of coal on cars at Toledo as follows: Per ton of 2,000 lb.

Table showing prices for Straitsville lump, Shawnee lump, Lehigh, Hocking Valley lump, and Anthracite (Pittston, Wilkes-Barre, Lackawanna, Lehigh).

Rates of Transportation on Anthracite Coal to Tide Ports. Table showing rates for Lehigh and Wyoming Coals per ton of 2240 lb.

Table showing Rates of Transportation on Anthracite Coal to Tide Ports for various routes (To Newark, N. J., to Philadelphia, N. J., to Elizabeth, N. J., etc.).

From *Mauch Chunk to New York* (121 miles), (towing limits) and Jersey City via Lehigh Valley RR. \$1 25
 From *Mauch Chunk to Philadelphia* (93 m) via L. V. and L. and S. RR. and North Penn. RR. 1 25

From *Mauch Chunk to Philadelphia* (92 m) via L. V. and Perkiomen RR. 1 40
 For way points between *Mauch Chunk* and *Phillipsburg* on the New Jersey Railroads. 1 00

From *Phillipsburg, N. J.*, to *Hoboken* (84 m) for shipment via Delaware, Lackawanna & Western RR., Morris and Essex Division. 65

From *Phillipsburg, N. J.*, to *Newark* (75 m) via Delaware, Lackawanna & Western RR. 66

* Rates on line coal from Hazleton are 10c. per ton above these figures.

† The cost of unloading is to be added to these rates. No charge less than 40c. per ton will be made for any distance. Tolls from *Mauch Chunk* to *Phillipsburg* for way points will be \$1 00 per ton.

‡ On coal received by canal at Jersey City, a charge additional to the freight, of twenty cents per ton, will be made for transferring it from boat to boat, and thirty cents per ton for placing the same on the wharves and reshipping.

The distances in the above table are computed from *Mauch Chunk*. From *Ashley to Mauch Chunk* the distance is 51 miles and from *Upper Lehigh*, 33 miles. From *Hazleton* 24 miles and from *Penn Haven* 8 miles.

From *Wilkes-Barre to Perth Amboy* via the Lehigh Valley Railroad Company, the distance is 161 miles, and from *Mauch Chunk* it amounts to 106 miles.

Schuylkill Coals.

per ton of 2240 lb.

	From Pine Grove.	From Tamaqua.	From Schuylkill Haven.	From Port Clinton.
To <i>Port Richmond</i> , via P. & R. R. R., Main Line, for shipment	1 70	1 65	1 50	...
<i>Harrisburg</i> , via Lebanon Valley Branch	1 10	1 60	1 45	...
<i>Allentown</i> , via East Pennsylvania Branch	1 37	1 32	1 17	...
<i>Lancaster</i> , and points on Lancaster Branch, via R. & C. R. R.	1 40	1 44	1 29	...
<i>Dauphin</i> , via Schuylkill and Susquehanna Branch	93	1 32	1 17	...
<i>Statewide Junction</i> , via Berks and Lehigh ranch	1 52	1 47	1 32	...
<i>Lebanon</i> , via Lebanon and Tremont Branch	84	...	...	...
<i>Philadelphia</i> via Schuylkill Canal, including freight and charges for the use of cars and barges and for tolls (exclusive of cost of unloading)	...	...	1 40	1 29
<i>New York</i> via Schuylkill Canal, including freight and charges for the use of cars and barges and tolls on the Schuylkill Canal and Delaware and Raritan Canal and the towing between Fairmount and Borden-town and between New Brunswick and New York (exclusive of cost of unloading)	...	...	2 25	2 40

From *Tamanend*, to *Catawissa*, *McAuley*, *Mainville*, *Expert*, and *Danville*, via Catawissa and Williamsport Branch Railroad. 90

From *Tamanend* to *Williamsport*, *Halls*, and *Montoursville*, via Catawissa and Williamsport Branch Railroad. 25

Coal sent to points on the Catawissa and Williamsport branch will be charged one and one-half cent per ton per mile, and two cents per ton additional to *Tamanend*.

An additional charge of 25 cents per ton will be made on Chestnut and Pea Coal to whatever point consigned. If the shipper signs a release of all demands arising from a deficiency of weight at the place of destination, and agrees to indemnify the company from all claims by reason thereof, such additional charge will not be made. Releases, properly prepared, will be furnished, and can be signed at the coal offices of the company, at St. Clair, Palo Alto, Schuylkill Haven, Mount Carbon, Pine Grove, and Tamaqua.

For shipment via Main Road or Schuylkill Canal, one and one-half cent per ton per mile, and two cents per ton additional to Schuylkill Haven, Pine Grove, Tamaqua, or Port Clinton, for Canal, as the case may be.

For consumption at local points in coal region, including Shamokin, Herndon, Schuylkill Haven, Pine Grove, and Tamaqua, three cents per ton per mile, and two cents per ton additional; and a charge for *car service*, of fifteen cents per ton to individuals, and five cents per ton to manufacturers, when in Philadelphia and Reading Railroad cars, provided no charge, including freights, tolls, and car service, shall be less than twenty-five cents per ton.

Sent westward via Northern Central Railway (in N. C. R. W. Co.'s cars), four and two-tenths cents per ton per mile, to Locust Gap, Shamokin, or Herndon, provided no charge will be made less than fifteen cents per ton.

One mile extra will be added for coal passing through the East Mahanoy Tunnel.

Fractions of distances and rates will always be stated in tenths.

No charge will be made for weighing or making returns of coal shipped, and the latter will be furnished free of charge, upon application to the Weighmaster; if these returns are to be sent by mail, envelopes, properly stamped and addressed, must be furnished to the Weighmasters.

All coal will be charged the rates (both lateral and Main Line) current on the day it is weighed; it will also be way billed on the same day.

OFFICE OF THE P. & N. Y. R. R. Co., }
 Bethlehem, Aug. 20, 1877. }

On and after this date the rate on coal for Buffalo, for Watkins, Ithaca, and Weedsport, for water shipment; Auburn, for New York Central R. R.; Sterling, for Lake Ontario Shore R. R., and Fair Haven, will be \$1.19 per gross ton, between Coxton and Waverly. On all coal transhipped at Waverly into broad gauge cars, an additional charge of 10 cts. per ton will be made to cover the expense thereof. The full rate from Coxton to Buffalo is \$3.26; to Rochester, \$2.91.

ROBERT H. SAYRE, President.

Geneva, Ithaca and Sayre Railroad.—The rates of transportation on coal per gross ton from Coxton, subject to regulations printed below, will be as follows:

To East Waverly, N. Y.	\$2 05
" Ithaca for C. Lake RR. (local)	2 14
" " for C. L. RR. and for shipment via Erie Canal	1 65
" Geneva (local)	2 14
" Geneva for S. P. and S. and L. O. S. Railroads, and for N. Y. C. and H. R. RR., except Auburn and Cayuga	2 14
To Geneva for Buffalo and Tonawanda	1 97
" " Genesee Docks	1 91
" " Rochester and Charlotte	2 10
" " Auburn and Cayuga	3 00
Total rate to Buffalo	3 26
" " Rochester	2 91

REGULATIONS.

A charge of fifteen cents per ton will be collected of each consignee on all coal not unloaded within twenty-four hours after its arrival, and an additional charge of ten cents per ton for every twenty-four hours thereafter; Sundays and legal holidays excepted.

No allowance will be made for coal lost from cars on account of broken doors or other defects existing when the cars are loaded.

Seventeen cents per ton will be charged, at Ithaca Docks, for shipping coal direct from cars to vessels, and 12 cents per ton additional from stock, making a total charge on what is shipped from stock of 29 cents per ton.

All freights will be collected weekly, by drafts on shippers, from Coxton to destination.

ROBERT A. PACKER, President.

SAYRE, Pa., Aug. 18, 1877.

Rates of Freights on Pittston Coal from Newburgh, and Lackawanna Coal from Rondout. By Company's Boats per ton of 2240 lb.

Troy and West Troy; if discharged above the bridge or locks, or at railroad docks	55
Troy and West Troy, except as above	50
Albany, Greenbush and Castleton Stuyvesant, Coxsack, (lower dock), Catskill, (at mouth of Creek), German-town	55
Coeymans' Hudson & Boston Railroad Dock, Hudson, discharged to cars	55
Hudson, (except as above)	45
Saugerties, (at mouth of Creek), and Glasgow, Barytown, Peekskill, (River ocks), Haverstraw (Peck's Dock), and Grassy Point	40
(If boats are moved from Peck's Dock to adjacent points, and returned there within two days, without expenses to the Company, no extra charge will be made.)	
Rhinebeck, and Hyde Park, Poughkeepsie and New Paltz Landing	30
Fishkill Landing, Cornwall, Cold Spring, West Point and New Windsor	25
Nyack, Sing Sing, Croton Landing, Verplancks, Tarrytown, Piermont, Yonkers	45

Rates of Transportation on Coal via the Erie Canal, from New York and shipping points in its vicinity, per ton of 2,240 lb., alongside at destination.

Lake Freights on Coal.

From Buffalo to Chicago	\$0.37@0.35
" " to Milwaukee	0.35
" " to Duluth	0.60
" " Toledo, O.	0.20
" " Sandusky	0.20
" " Detroit	0.30
From Cleveland to Chicago	0.35@0.40
" " Milwaukee	0.37@0.40
" " Detroit	0.75
" " Racine Quebec free	0.45
From Black River, Mich., to Toronto, Can., gold free	0.09
" " " to Brockville, "	1.30
" " " to Milwaukee	0.40

Rates of Toll

On the Erie, Champlain, Oswego, Cayuga, and Seneca Canals Toll is to be computed upon the weight, 1,000 lb. per mile.

Cents.	Cents.
Acid, sulphuric	*Iron & steel in sheets, bars, and bundles
Car wheels (iron)	Iron ore
Castings, all iron cast-ings	" " bloom and pig
Cement, fireproof	" " boiler
Clay	" " bridge and railing
Coal	" " bolts
Coal oil	Lime, manufactured
Copper ore, pig and smelted	Lumber
Fire-brick	Petroleum, crude or refined
Gas pipes	Powder & gunpowder
Gypsum, ground and unground	alt. foreign
Gypsum, product of New York State	" " manufactured in New York State
Iron, articles exclusively manufactured of wrought iron not specifically enumerated when cleared at tidewater	late
	tone
	Tin plates, going from tidewater

* The rate on these articles, when cleared at tide water, is 0.05 cent.

Lead, bar and pig, is transported free of toll.

Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

From the *Mines to Piedmont, Cumberland or State Line*, 4c. per ton of 2,240 lb. per mile on distances less than 4 miles, and 3 cents per ton per mile on distances over 4 miles, and 2 cents per ton per mile on distances over 100 miles.

From *Piedmont to Baltimore* (206 miles), \$1.85 per ton of 2,240 lb., or \$1.65 per net ton.

From *Cumberland to Baltimore* (178 miles), \$1.54 per ton of 2,240 lb., or \$1.37 per net ton (1/2 cent. per ton per mile for use of hoppers over C. & P. RR.).

From *Cumberland to Georgetown* (152 miles) by canal, 70c. @ 90c. Tolls 40c.

From *Osceola to Greenwich, Phila.* (say 248 miles, per T. & C. RR. per ton bituminous coal of 2,000 lb, less drawback, \$1.90 @ \$2.15.

From *Osceola to South Amboy, N.J.* (317 miles), per 2,000 lb., \$4.03, less drawback, \$1.28; net rate per ton of 2,000 lb., \$2.75; net rate per ton of 2,240 lb., \$3.08; transshipment charges 20 cents additional.

Towing.

For rates of towing we refer to our issue of Aug. 4.

Freights

Representing the latest actual charters up to Sept. 6. Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Jervis, South Amboy, Hoboken and Weehawken.
Augusta, Me.	...	...	...	1 50
Albany	...	...	...	...
Alexandria, Va.	...	...	...	...
Annapolis, Md.	...	...	...	...
Bangor, Me.	150@155	1 75	...	90
Bath, Me.	1 38	1 50	1 50	1 00
Baltimore	55	...	...	...
Boston, Mass.	120@140	1 50	1 55	90
Bridgeport, Ct.	...	1 45	1 35	50
Bristol, R. I.	...	...	1 40	80
Beverly, Mass.	1 25	...	...	1 00
Cambridgeport, Mass.	1 25	...	...	90
Charleston, S. C.	1 00	...	...	...
Danversport, Mass.	1 25	...	...	...
East Greenwich, R. I.	...	...	...	...
Fredericksburg, Va.	...	...	...	...
Fall River	1 15	1 40	1 40	80
Gloucester	...	...	...	...
Hingham, Mass.	...	...	...	...
Hartford, Conn.	...	...	...	...
Hoboken	...	...	1 20	35
Hudson	...	...	...	...
Jersey City	...	...	1 20	35
Lynn, Mass.	...	...	...	...
Medford, Mass.	...	...	...	...
Middletown	...	...	...	...
Nantucket, Mass.	...	...	...	...
New Bedford	1 18	1 40	1 40	80
Newburyport	...	1 60	...	1 00
New Haven	...	1 30	1 35	50
New London	1 15	1 40	1 40	...
Newport	1 15	...	...	80
New York	90@95	1 30	1 25	35
Norfolk	...	...	...	75
Norwalk	...	...	...	50
Norwich	1 25	...	...	90
Pawtucket	1 25	...	...	...
Philadelphia	107@125	1 50	1 50	90
Portsmouth, N. H.	1 30	1 60	1 70	...
Providence	115@120	1 30	1 40	...
Poughkeepsie, N. Y.	...	...	...	...
Quincy Point, Mass.	1 30	...	...	...
Richmond, Va.	75@80	...	...	...
Saco	1 30	...	...	90
Salem, Mass.	...	1 50	...	...
Savannah, Ga.	...	...	...	...
St. John, N.B.	...	...	...	...
Somerset, Mass.	1 15	1 40	...	...
Troy	...	...	...	...
Trenton, N.J.	...	...	...	...
Washington	90	...	...	...
Wilmington, N.C.	...	...	...	...
Wareham	...	...	1 50	...

* And discharging and towing. † And discharging. ‡ And towing. § 3c per bridge extra.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, Sept. 7, 1877.

American Pig.—There are rumors of several lots of iron having been sold at prices under the market, supposed to be by companies whose financial necessities are pressing. Pig iron has not yet felt the improvement in demand that is noticed in many branches of trade, but there is among a number of the leading furnace companies a disinclination to sell for future delivery at present prices. Some of them are closely sold up and others well sold ahead—the Thomas Iron Company having orders on its books sufficient to keep its furnaces now in blast, running until the end of the year. We continue to quote No. 1 foundry at \$18@19; No. 2 foundry \$17@18; and forge \$16@17.

Scotch Pig.—This article has only been sold in small lots at our quotations which are as follows: Eglinton, \$24.50; Glengarnock, \$25@25.50, and Coltness, \$26.50@27.

Rails.—We are reported sales of two lots of 3,000 tons each of iron rails, both on private terms. There has been a better business in iron rails during the past month while there are indications that considerable contracts for steel rails will be made during the next sixty days. We quote iron rails, at mills, at \$33@38, and steel at \$43@45.

Old Rails.—Without business we quote nominally at \$19.

Scrap.—We quote a sale of 300 tons on private terms, and quote nominally at \$23.

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.	Feet on Vein.	Capital Stock	SHARES		ASSESSMENTS.			DIVIDENDS.			HIGHEST AND LOWEST QUOTATIONS PER SHARE IN CURRENCY.								SALES.									
			No.	Par Val.	Total levied to date.	Date and amount per share of last.		Total paid to date.	Last Dividend.		Rate per Ann.	Sept. 1.		Sept. 3.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.						
						Mo.	Yr.		Amt.	Mo.		Yr.	Amt.	H.	L.	H.	L.	H.		L.	H.	L.	H.	L.	H.	L.		
Coal Stocks.																												
Consol. Coal.	Md.	10,250,000	102,500	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Del. & H. Canal.	Pa.	20,000,000	200,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Del., Lac. & W. RR.	Pa.	26,200,000	262,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Lehigh C. & N.	Pa.	10,448,550	208,911	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Lehigh Valley RR.	Pa.	27,042,900	540,858	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Maryland Coal.	Md.	4,600,000	46,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N. J. Central RR.	Pa.	20,600,000	206,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Penna. Coal.	Pa.	5,000,000	50,000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Pennsylvania RR.	Pa.	68,868,700	1,377,376	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Phil. & Read. RR.	Pa.	34,278,755	685,575	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
General Mining Stocks.																												
Alpha Cons. g. s.	Nev.	300	3,000,000	30,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Am. Flag, g.	Colo.	5,300	53,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Belcher, g. s.	Nev.	1,040	10,400,000	104,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bertha & Edith, g.	Vir.	645 acs.	3,500,000	35,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Best and Belcher, g. s.	Nev.	545	10,080,000	100,800	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Bobtail, g.	Colo.	2,500	1,366,630	27,336	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bobtail Tunnel, g.	Colo.	100,000	20,000	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Bullion, g. s.	Nev.	943 1/2	10,000,000	100,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Caledonia, g. s.	Nev.	2,188	10,000,000	100,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
California, g. s.	Nev.	600	54,000,000	540,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Chollar Potosi, g. s.	Nev.	1,400	2,800,000	28,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Cleveland, g.	Colo.	3,715	250,000	25,000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	10,000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Cons. Imperial, g. s.	Nev.	468	50,000,000	500,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Cons. N. Slope & E.C.T.	Colo.	15,000	500,000	10,000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Cons. Virginia, g. s.	Nev.	710	54,000,000	540,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Confidence, g. s.	Nev.	130	2,400,000	24,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Crown Point, g. s.	Nev.	600	3,000,000	30,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Douglas, g. s.	Colo.	21,000	1,000,000	10,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Eureka Cons. g. s. L.	Nev.	500	5,000,000	50,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Eureka G. Mr. g.	Calif.	2,000	2,000,000	20,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Exchequer, g. s.	Nev.	400	10,000,000	100,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Gould and Curry, g. s.	Nev.	621	10,800,000	108,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Granville Gold.	N. C.	9,000	1,000,000	10,000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Hale & Norcross, g. s.	Nev.	400	11,200,000	112,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Henry Tunnel.	Nev.	3,000	2,000,000	20,000	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Hukill, g. s.	Colo.	3,288	1,000,000	10,000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Indian Queen, g. s.	Nev.	1,000	3,000,000	30,000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Jules Cons. g. s.	Nev.	3,000	11,000,000	110,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Justice, g. s.	Nev.	2,100	10,500,000	105,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Kentuck, g. s.	Nev.	95	3,000,000	30,000	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Kossuth, g. s.	Nev.	2,700	5,400,000	54,000	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Lacrose, g.	Colo.	3,900	1,000,000	10,000	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Leopard, L. g. s.	Nev.	1,500	5,000,000	50,000	100	100	100																					

Manufacturers of copper goods are reported to be doing a better business and to be making more inquiries for ingot. According to the latest telegraphic advices Chili Bars in London were £67.10 (a decline of £1) and Best Selected £75.

Tin.—Straits in London is quoted at £65; at Penang, \$19.25 per picul, and at Singapore, \$19.50, with exchange at 4. We note sales in this market of about 500 pigs, at 15c. @ 15½c., according to quantity. We quote, in gold, per lb.; Refined, 15c.; Australian, 15½c. and Banca, 17½c. Straits, 15c.; L. & F. 14½c.

Tin Plates continue to have a fair jobbing demand. We quote, as last week, in gold, per box, as follows: Charcoal tins, \$6.62½ @ 6.75; and ternes, \$6.12½; coke tins, \$5.75, and ternes, \$5.50 @ 5.62½.

Messrs. Robert Crooks & Co., of Liverpool, under date of August 23, say of tin and ternes plates: "Condition of market continues as last advised, with perhaps a trifle less strength in coke tins. Buyers, however, show a disposition to avail of any reduction in these, so it appears unlikely that a panic will seize them as it has charcoal tins, which are being offered at a drop of 6d. to 1/ without finding buyers. Ternes occupy a neutral ground, and are quiet, with small business, at former figures."

Lead.—We note sales of 50 tons ordinary lead at 490c., and about 100 tons of Missouri soft, in lots, at the same price. The market is nominal at 47½c.

Spelter and Zinc.—Domestic spelter is not so plentiful, owing to the stoppage of works in the West, and may be quoted at 6 @ 6¼c. Sheet zinc is still quoted at 7½ @ 7¾c.

Antimony is quoted at 113½c. gold.

Quicksilver.—The San Francisco Commercial Herald of August 30 says: "The operations and fluctuations of the market both here and abroad during the current month of August have puzzled the very keenest observers to devise the cause thereof, and even at this writing the public are ignorant of the true cause. Suffice it to say that we are not at liberty to publish all we know concerning the late sudden and remarkable rise in Hongkong, London, etc. As we write the cable announces the London price at £9. Since our last reference not less than 5,000 flasks have been contracted for by well known capitalists of the Comstock mines at 50c. Other purchases for export have also been made within the past few days in lots at 50 @ 52c., and the market closes strong at 52c. without recourse to a combination or 'ring' among the producers as from time to time contemplated. The spot stock here is light and much already sold that is to arrive from the interior. Very large and considerable speculative purchases other than those above noted have recently been concluded, but we are positively forbid giving the details at this time. We copy the following from the Gold Hill News of August 21st: "During the past week Humbert Brothers have received at their landing, near Steamboat Springs, fourteen car-loads of machinery to be used in the erection of the Nevada Quicksilver Mining Company's works. The works are situated at the base of the mountain, one and one-half miles west of the Steamboat Springs, and will be ready for operation in about four weeks' time. They will have a reduction capacity of twenty-five tons per day. The ore is said to contain about one per cent. of Quicksilver, one-half of one per cent. being estimated as sufficient to pay for working. The receipts of Quicksilver for the week aggregate 1,194 flasks. The Newbern carried only 10 flasks for Mexico. On the 23d inst. two car-loads arrived at Virginia City, one on the 24th, and two on the 25th, being equivalent to over 1,000 flasks. The market closes strong, being entirely bare of stock, not 200 flasks in first hands. Holders ask 54 @ 55c., and buyers offer but 52½c. Since the above was placed in type we learn that the Oceanic, now en route from Hongkong, brings as return cargo 1,000 flasks. We note sales of 600 old second-hand empty flasks at 85c."

Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, Sept. 7, 1877.

Argentiferous Lead (Base Bullion).—\$50 @ 52 per ton for lead. \$1.18 per ounce for silver. \$20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120 ounces per ton of 2,000 lb.

The *Inter-Ocean's* correspondent, under date of the 25th ult. says: "There is a noticeable change for the better in the bullion market, and a sale of 10 cars to Omaha, and 10 cars to Chicago are reported; price, \$50 per ton for lead, and \$1.17 per oz. for silver."

"The shipments of ore and bullion for the week ending Aug. 25, were as follows: 10 cars bullion to Omaha; 14 cars bullion to Pittsburg; 8 cars bullion to St. Louis; 5 cars bullion to New York; 8 cars bullion to San Francisco; 1 car lead ore to Omaha; 2 cars lead ore to Hilliard; 12 cars lead ore to Pittsburg. Total, 60 cars. Bullion, 959,768 lb.; lead ore, 314,949 lb. Total, 1,274,717 lb.

"While there is no advance in lead to report, there is a better feeling among the smelters, and more activity apparent.

"The Williams smelter has shut down till there is a better price for bullion."

FINANCIAL.

New York Stocks.

NEW YORK, Friday Evening, Sept. 7, 1877.

There has been a very liberal business in the coal shares, and prices have been greatly advanced in the face of facts that should have had quite the reverse effect in a market influenced by natural causes. We can but presume that a very large proportion of the business has been "washed" for we cannot think that the public has unloaded to an extent to produce the totals we find before us, while it is quite certain that the same public has not purchased to an extent to produce these aggregates, or been selling what they do not own. The sales of Delaware & Hudson Canal Company have aggregated 16,864 shares at 48¼ @ 57¼, closing at 55. Delaware, Lackawanna & Western Railroad has ranged from 49¼ to 59½, closing at 57½. New Jersey Central shows sales of 5,089 shares at 16 @ 19¼, closing at 18.

Bonds.—The transactions in bonds have been quite large and pretty evenly distributed throughout the list. The prices in nearly all instances show an improvement, notably in the consolidated bonds of the Lehigh & Wilkes-Barre Coal Company, which advanced from 31 to 39 per cent., with sales amounting to \$90,000. The bonds of the Chesapeake & Ohio Railroad Company advanced from 22 to 25, with sales aggregating \$5,000.

Chester & Tamara Coal & Railroad Company.—The United States Supreme Court decides, in favor of A. S. Post, that Randolph County, Illinois, is bound to pay the bonds issued to this company.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 7th inst. are given in the following tables. The Philadelphia quotations will have a * affixed. The Baltimore quotations are indicated thus †.

STOCKS.

	QUOTATIONS.			Sales
	High-est.	Low-est.	Clos-ing.	
American Coal Co.	—	—	25	—
*Cambria Iron Co.	—	—	50	—
*Pennsylvania Salt Manfg Co.	—	—	65	—
*Westmoreland Coal Co.	—	—	60	—
*Buck Mountain Coal Co.	—	—	25	—
*Schuylkill Nav. Co.	—	—	—	—
St. Louis, I. M. & S. RR. Co.	7	6¾	6	200
Spring Mountain Coal Co.	—	—	30	—
†Balt. & Ohio RR. Co. pref.	—	—	100	100
" " " common	130	115	96	108
†Pittsburg & Connellsville RR.	—	—	—	—
†George's Creek Coal Co.	—	—	96	—
†Santa Clara Mining Co.	—	—	7	—
†Atlantic Coal Co.	—	—	1.25	—

BONDS.

D., L. & W. 78, Convlt., 1892 J. & D.	103½	—	—	—
" " " 2d mtge., 1881 M. & S.	—	—	103½	500
N. J. C., 1st mtge., new, F. & A.	110	109½	110	16,000
" " " 1st mt., cons. 1899 Q.	71	—	70	15,000
" " " Convlt. M. & N.	67½	67	66¾	13,000
L. & W. B. Coal Co., cons. Q.	39	31	37	90,000
Am. Dock & Imp. 78, J. & J.	51	42¾	50	20,000
D. & H. C. Co., 1st mt., 1884 J. & J.	98½	—	98½	2,000
" " " 1891 J. & J.	99½	—	99½	9,000
" " " 1877 J. & J.	—	—	102½	—
" " " reg., 1894 A. & O.	—	—	150½	—
" " " coup., 1894 A. & O.	99	—	99½	5,000
St. L. I. M. & S., 1st mt., 1892 F. & A.	96½	96	94	51,000
Ches. & Ohio, 1st mt., 1899 —	25	22	22	5,000
*L. V. RR., con. m. 68, 1893 J. & D.	94	93¾	93	3,000
" " " 2d m., 78, 1890 M. & S.	—	—	107	—
" " " reg., 1898 J. & D.	—	—	—	—
*P. RR., 1st mtge., 1880 J. & D.	—	—	108	—
" " " Gen. mtge. reg., 1910 A. & O.	108½	—	108½	2,000
" " " Con. m. 68, con., 1905 J. & D.	—	—	—	—
" " " reg., 1905 Q.	—	—	91¼	—
" " " Gen. M. Coup., 1910 J. & J.	105½	—	105½	3,000
" " " New Loan 58 —	—	—	—	100
*P. & R. RR., 78, 1893 A. & O.	101	—	108½	—
" " " con. m. 78, con. 1911 J. & D.	101	100½	100	10,000
" " " Deb. 68, 1893 J. & J.	—	—	40	—
" " " New convlt. 78, 1893 J. & D.	54	—	—	200
" " " Con. mtge. 78, reg. J. & D.	100¾	—	100¾	5,000
" " " Income 78 — 1896 J. & D.	—	—	—	—
*P. & R. C. & I. Co. Deb. 78 M. & S.	50	—	50	5,000
*P. & R. C. & I. Co. —	—	—	50	10,000
*L. C. & N. Co. 68, 1884 M. & Q.	—	—	55	—
" " " RR. loan 1897 F. & Q.	102½	—	103¾	1,400
" " " Con. mtge. 78 J. & D.	—	—	103	—
" " " Cvt. gold, 1894 M. & S.	—	—	—	—
" " " Gold Loan, 1897 J. & D.	87¾	87½	87½	1,500
*Schuylkill Nav. 68, 1897 M. & Q.	—	—	—	—
*Pa. and N. Y. Canal, 78 J. & D.	—	—	108¾	—
*Pa. Canal Co. —	—	—	—	—
*Susquehanna Coal Co. 68 —	—	—	—	—
*Ches. & Ohio 1st m. 68, M. & N.	—	—	—	—
†Balt. & Ohio 68, 1880, J. & J.	—	—	102½	—
" " " 68, 1885, A. & O.	—	—	106	—

Total transactions for the week \$221,700

Philadelphia Stocks.

PHILADELPHIA, FRIDAY EVENING, Sept. 7, 1877.

This market has been very steady during the operations of the past week, and, with the exception of a slight advance in the shares of the Philadelphia & Reading Railroad, the closing quotations exhibit but little change compared with the prices prevailing a week ago. The total transactions amount to about 120,000 shares, of which amount 92,000 shares were in Pennsylvania Railroad stock.

Mammoth Vein Coal and Iron Company.—A recent auction sale of \$1,000 of the mortgage bonds of this company brought 67½ per cent.

Lehigh & Lackawanna Railroad Company.—A special meeting of the stockholders of this company will be held at its office October 8th, to consider the propriety of extending the railroad to the Wind Gap; and also, to consider and vote upon a proposition to increase the indebtedness of the said company for that purpose.

Allentown Iron Company.—A special meeting of the stockholders of this company will be held on the 8th of November, to take action on the creation of a loan upon mortgage, and to pass upon such amendment or amendments to the charter as may be considered necessary in the premises.

Copper Stocks.

Reported by Wilson W. Fay & Co., Bankers and Brokers Room 7, Traveler Building, 31 State Street.

BOSTON, THURSDAY EVENING, Sept. 6, 1877.

A very fair amount of transactions have taken place since last week, and indications are strongly in favor of more business and better prices for the stocks, the only drawback being the low price of ingot copper, which has fallen to 17¼ cents. Nevertheless, the principal stocks look strong, even under this disadvantage, and show what they would be capable of doing should the price of copper take an upward turn.

Calumet & Hecla appears to be an exception, and has fallen off to 169 bid, and 170 asked, and is strong at those figures.

Quincy has shot up 2 per cent., and is selling at \$35, with \$35 bid, and \$35½ asked. Copper Falls has sold as high as 3½ in odd lots, but is rather quiet than otherwise at 3½ @ 3¼.

The silver stocks have been unusually dull; Duncan falling to 2¼ bid and 2¾ asked, and International quiet but firm at 31 bid and 33c. asked. Dawson hangs steady at 10 @ 12c.

Central closes 39½ bid and 40 asked. Allouez is getting disgusted with the lack of bidders for the stock and has been offered from \$6.00 down to \$3.00 within a few weeks and no buyers at that price. Ridge is steady at \$1.75 to \$2.00. National has been quoted as low as 22½, probably on wash sales, as there are parties willing to take the stock at that price, and even a little higher, but can find none for sale at those figures. The correct market for the stock is 28 bid, and 31 asked.

Copper Falls Mining Company.—This company will hold its annual election in Boston Sep. 12.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Sept. 7, 1877.

The number of shares sold on the mining board during the week under review show an aggregate differing but little from that of several weeks past. The transactions in Moose have amounted to 17,475 shares at 5½ @ 5¾. Bertha and Edith has ranged from \$1.25 @ 1.35, with sales of 14,500 shares. The sales of Cleveland aggregate 2,400 shares at 6½ @ 6¾. Ontario has been dealt in to the extent of 1,100 shares at 22 @ 22¼. Quicksilver preferred advanced to 33½, closing at 33, with sales for the week of 1,000 shares. The common stock has ranged from 18½ @ 18¾, with sales of 700 shares. The Comstock shares are receiving but little attention, while the other stocks on the list that have not been mentioned above are not receiving attention worthy of notice.

Ontario Silver Mining Company.—This company announces its usual monthly dividend of 50c. gold per share, payable on the 15th inst., also an extra dividend of the same amount payable on the same date, the total sum aggregating \$100,000. This makes \$500,000, equal to \$5.00 per share which this company has returned to its stockholders on this account. The August production of the company amounted to \$165,535.73, assay value, adding this to the balance on hand Aug. 1st and deducting the two dividends just declared, the gold balance on the 1st inst. should be \$220,025.18.

Moose Silver Mining Company.—This company has declared its quarterly dividend, the amount being 25c. per share against 30c. per share as formerly. This dividend is at the rate of 10 per cent. per annum on the par value of the stock. The reason for deducting the 5 per cent. is that the management having demonstrated the success of their amalgamation works in reducing their low grade ores, they wish to double the capacity of the works, so as to more rapidly reduce the 40,000 tons of fourth grade ore that has accumulated, for which they take the necessary funds from the cash surplus and the dividend fund as above.

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing price of mining shares in San Francisco to-day:

Alpha	11	Leopard	13¼
Belcher	6½	Mexican	10
Best & Belcher	17¼	Northern Belle	18
Bullion	—	Ophir	16¾
Caledonia	4½	Original Comstock .....	..
California	28¾	Overman	26
Chollar Potosi	34½	Raymond & Ely	15
Cleveland	—	Santiago .....	..
Con. Imperial	1	Savage	7½
Con. Virginia	32¾	Seg. Belcher	41½
Confidence	—	Sierra Nevada	4½
Crown Point	4	Silver City .....	..
Eureka	43	Silver Hill .....	..
Exchequer	—	South Comstock	3½
Gould & Curry	9½	South California .....	..
Hale & Norcross	6½	Southern Star .....	..
Indian Queen	—	Trenton .....	..
Julia	1½	Union Con.	5½
Justice	10	West Belcher .....	..
Kentuck	5	Yellow Jacket	10½
Kosuth	—	Young America .....	..

San Francisco Mining Share Market.—The Commercial Herald of the 30th ult. says: "We are enabled to report quite an improvement in the mining share market during the past week, the list being generally affected by the upward tendency of the more prominent stocks. A marked and energetic effort at concentration has exhibited itself for some time past, which, owing to the wider distribution of the cut-up shares than was formerly the case, takes longer time to bring together for effective work, and thus the expected rise has been delayed much longer than the general outside dealer anticipated. It will require a very thorough and careful concentration—in the absence of developments in any new sections of the Comstock Lode—to bring or keep them up to anything like former prices, or even more recently advanced rates, before they came down to the bed-rock rates that have ruled so long. The capital is here and apparently ready for investment so soon as the proper demonstration is made, but we are of the opinion that it will move with much more caution than was ever before known in the mining stock history of San Francisco."

The Hukill Silver Mining Company has declared a dividend of one per cent., payable on the 10th inst.

The Merrimac Silver Mining Company has declared its usual monthly dividend of one per cent., payable on the 10th inst.

Eureka Consolidated Silver Mining Company.—This stock closes in San Francisco to-day at \$43 per share. It is asserted that this company will declare a dividend of \$5 per share some time during the present month. The company are making active preparations to work the mine to its full capacity.

Gas Stocks.

NEW YORK, FRIDAY EVENING, Sept. 7, 1877.

We lower a number of the quotations of gas stocks, the market is very weak and inactive. The impression prevails that the general market will go much lower.

The Lancaster (Pa.) Lowe Gas Works.—The formal inauguration of these works took place on the 31st ult. A number of scientific men and gentlemen interested in gas manufacture from different parts of the country were present. The Daily Era, of the 1st inst., which is published at this city, gives the following account regarding tests of the illuminating quality of the gas: "It was now announced that Mr. Goodwin was ready to report the results of his tests. He prefaced his report by saying that in testing the illuminating powers of gas, they used a standard burner and a standard candle. The burner used on this occasion consumed five feet per hour, and the candle at the rate

of 120 grains of spermaceti in the same time. The result of his test showed a candle-power equal to 20'27. Mr. Brown, Chief Engineer of the Philadelphia Gas Works, without knowing this result, made a test of his own which gave 20'65, a difference of only (.38) thirty-eight hundredths. The result of the test for purity was then announced by Mr. Goodwin. The analysis showed a specific gravity of .597 or nearly six-tenths; of sulphureted hydrogen, 1 per cent.; carbonic acid, 1 per cent.; luminants (the light-giving principle), 11 per cent.; in ordinary coal gas there is from 5 1/2 to 6 per cent.; oxygens, 7 1/2 per cent.; in ordinary coal gas, 5 per cent.; carbonic oxide, 2 per cent.; in ordinary coal gas from 2 to 3 per cent.

In reply to a question proposed, Mr. Parks, who "mixes" all the gas in the Philadelphia works, said he indorsed all that Mr. Goodwin said.

Henry Morris, an old builder of gas works, testified to the beautiful working of the process, and he said he had been better satisfied with it to-day than ever before.

Yonkers (New York) Gas Supply.—We note the statement that gas is furnished to Yonkers consumers at \$1 per 1,000 feet.

Buffalo, N. Y., pays about \$70,000 per year for gas, the city gas bill for August having amounted to \$5,612.

Lease of the Citizens' Gas Works, of Louisville, Ky.—This company solicits proposals for the leasing of its entire works and fixtures for a term of six years. The company will accept of a certain money rent, payable semi-annually during the term. Or will accept in part payment of the rent iron pipe, to be substituted for the wooden pipe now in use. There has already been a considerable portion of piping laid down, and the company has some thousand feet on hand, that will be sold on reasonable terms. It is estimated that 1,900 feet of 6-inch pipe, 7,200 feet of 4-inch, and 3,700 feet of 3-inch will be required to complete all necessary lines.

The Cleveland, Ohio, Gas Question.—At a recent meeting of the Common Council of Cleveland, Ohio, a proposition was read from the Citizens' Gas Company, in which that company proposed to furnish gas to the city at \$1.25 per 1,000 feet.

During the meeting the following resolution was adopted:

"Whereas, The Cleveland Gas Light & Coke Company have agreed to annul their existing contract with

the city and to furnish the city with gas at \$1.50 per 1,000 feet, providing the members of the City Council will agree to assist in securing the repeal of such portions of the Burns bill as may interfere with the completion of a contract between the city of Cleveland and the Cleveland Gas Light & Coke Company, to furnish gas to the city for \$1.50 per 1,000 feet for a term of six years:

"Resolved, That the City Council do hereby pledge themselves to assist in the before mentioned legislation, and agree to enter into such contract with the gas company so far as their power to complete such contract may appear, providing the provisional agreement of the gas company with the city be rigidly adhered to."

Peoples' Gas Company of Baltimore.—50 shares of this stock were sold during the week at from 14 1/4 to 13 3/4 per cent., closing at the latter price.

Gloucester, N. J.—A resolution has been introduced into the Common Council of this city, directing the Lighting Committee to alter the street lamps to burn coal oil instead of gas, and, after being debated, was laid on the table for two weeks.

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas stocks, No. 30 Broad street, N. Y.

Table with columns: Companies in New York and vicinity, Capital Stock, Par., Rate per an., Dividends (An. of last, Date of last), Bid, As'd. Lists various companies like Mutual N.Y., N.Y. Gold Bonds, N.Y. N.Y., Metrop., etc.

‡ Paid irregularly.

ADVERTISERS' INDEX.

Table listing various categories of advertisements such as Air Compressors, Assaying Tools and Chemicals, Attorneys and Counselors, Bankers and Brokers, Blasting Powder, Blowers, Books and Periodicals, Cement, Coal, Engineers' Instruments, Fire Brick, Gas Process, Hoisting Machinery, Hot Blast Stoves, etc.

Table listing various categories of advertisements such as Coal and Ore Separators, Copper Works, Dividends, Engineers and Chemists, Fire Brick, Gas Process, Hoisting Machinery, Hot Blast Stoves, etc.

Table listing various categories of advertisements such as Hotels, Hydraulic Jacks and Punches, Injectors, Locomotives, Metal Brokers, Mining Tools and Goods, Mineral Wood, Mining, Crushing, Stamping, and Smelting Machinery, Patents, Pumps, etc.

Table listing various categories of advertisements such as Colorado Central RR., Denver & Rio Grande RR., Denver, South Park & Pacific RR., Pennsylvania RR., Roofs, Girders, etc., Rock Drills, Rubber and Belting, Safes and Scales, Smelting and Refining Works, Steam Engines, Steam Regulators, Steel Works, Tubes and Pipes, Ventilators, Water Wheels, Wire Rope, etc.

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ESTABLISHED 1845.

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"Savage," "Jersey," "Laclede," "Scioto," "W. Va.," etc., etc., for Blast Furnaces, Rolling Mills, Steel Works, Smelting and Refining Works, Zinc Works, Lime and Cement Kilns, etc.

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Address FRANCIS MURPHY, C. E., Patentee; or JOSEPH S. SMITH, Esq., 410 Walnut Street, Philadelphia, Pa.

Patent Mineral Wool.

The Best Insulator of Heat or Cold.

A 3 inch lining, sufficient for Hot Blast Pipes, Furnaces, etc. Cheap enough for lining Frame Houses, and FIRE PROOF. State Rights for sale.

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SMELTING AND REFINING WORKS.
Corner 11th Av. and 15th St., New York City.
Buy Gold and Silver ores for cash. Satisfaction guaranteed.
Consignments and correspondence solicited.



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Importers of Assaying Materials and Apparatus.
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Etc., Etc.

Wire Rope, Scales, Hoisting Barrels and Ore
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POPE, COLE & CO.
ARE CONSTANT PURCHASERS OF
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And Matte, Regulus and other Furnace Material. Also Ores
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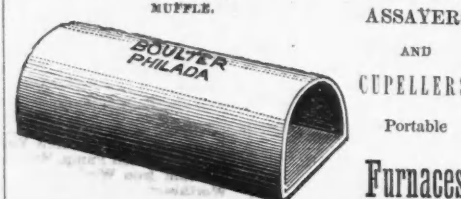
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P. O. Box 5672.

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Vegas, Santa Fe, etc.; at La Veta for Saguache, Del Norte,
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For further information apply to Ticket Agent, City Office,
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D. C. DODGE, Gen. Freight & Passenger Agent.
W. W. BORST, Acting Superintendent.

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