

THE ENGINEERING AND MINING JOURNAL.

VOL. XVII.—No. 7.—FOURTH SERIES.

NEW YORK, SATURDAY, FEBRUARY 14, 1874. PRICE 10 CENTS PER COPY.

The Formation of Concretions.

MR. HAWKINS JOHNSON, in a paper on the "Nature and Formation of Flints and Allied Bodies," shows the nature of several members of a large group of bodies occurring in sedimentary deposits of different ages, and which are generally known as nodules, and described as concretionary. Those specially alluded to are the septaria from the London and Kimmeridge clays, the flints from the chalk, the iron pyrites from the chalk, the phosphatic nodules of the Gault, the clay ironstone nodules of the carboniferous series, and the ironstone from the Woolwich beds.

By the gentle action of solvents, the structure of these bodies is revealed so as to be easily examined by the microscope. They are then found all to agree in possessing a silicified organic structure, which may be described as a network of fibres, or a mass permeated in every direction by anastomosing canals. This structure was subsequently filled in with other material, such as carbonate of lime, silica, bisulphide of iron, phosphate of lime, carbonate of iron, etc., the particular substance thus filled in depending upon the relative abundance of the substances dissolved in the interstitial water of the surrounding matrix.

The singular groups of concentric, siliceous, circular bands seen upon many fossils, and known as orbicular silica, or beekite markings, are also explained. The fossils on which they occur were imbedded in a matrix more porous than themselves, and of irregular constitution, so that the evaporation, to which the consolidation of the dissolved silica in their pores was mainly due, occurred at a number of points on the surface of the fossils, at which points a deposit of silica took place, forming the central tubercles. The cessation of evaporation was followed by a fresh saturation with the solution, to be again evaporated; but as the evaporating points were now plugged up by the previous deposits, the silica last consolidated was deposited around their margins and upon them internally, appearing outwardly as a ring round the tubercle. Alternations of these conditions account for the numerous bands seen in some of the groups.—*Chem. News.*

Scotch Blast Furnaces.

It is a noticeable fact in connection with the Scotch iron trade that the production of pig iron reached its maximum of 1,206,000 tons in 1870, falling off by regular gradations to 993,000 tons in 1873. According to *Engineering* there are at present seventeen firms in Scotland who own blast furnaces. In the years 1860, 1861, and 1863 there were 171 blast furnaces erected, but the highest number in blast in any one year was 136, in the year 1863. Going back to 1845, we find that there were 88 furnaces in blast at the end of the year; at the end of 1850 there were 143 erected, and 105 in blast; at the end of 1855, 157 erected, and 122 in blast; 1860, 171 erected, and 133 in blast; 1865, 163 erected, and 136 in blast; and at the end of 1870, 360 erected, and 126 in blast. The number of furnaces existing in Scotland, and nearly ready, at the end of the past year, was 152, as against 154 at the end of 1872. Amongst the most marked features worthy of mention in connection with the blast furnaces of Scotland, there is the fact that considerable progress is being made at Carron Iron Works, there being no fewer than three new furnaces in course of completion at that establishment, all very large, and close-topped, on the Cleveland system; there is also the fact that the Ferrie system of blast furnace practice is being extended, while at Summerlee Iron Works very marked economical success has attended the use of a furnace which is of a greatly increased size, and from which all the useful gases are collected, and turned to account. In one or two places further experiments are in progress, with a view to effecting a still greater degree of economy in making pig iron. The 119 furnaces in blast during 1873 produced on an average 8,344 tons of pig each.

New Steamboat Bill.

THE bill for regulating steamboats which was introduced into the House last winter, has been amended in committee and will be brought before both Houses this year. Some of the additions are as follows:

Section 4 of the bill, which provided that except on ferry-boats no loose hay (unless for feeding stock on board), no loose cotton, or loose hemp, camphene, nitro-glycerine, naphtha, benzole, benzole, coal-oil, crude petroleum, or other explosive burning fluid should be carried as freight on any steamer carrying pas-

sengers, now contains the following: "Except where there is no other public means of conveyance, and in such cases its transportation shall be under such rules and regulations as the Board of Supervisors or Directors may prescribe with the approval of the Secretary of the Treasury."

"No product of petroleum shall be used on any steam vessel for illuminating purposes, that will ignite at a lower temperature than 150° Fahrenheit."

"On all steamers the steering apparatus shall be so arranged, when operated by a steering wheel, that the top or upper side of the wheel shall be moved in the direction toward which the course of the steamer is to be changed."

From section 39, relating to the allowances for pressure in the boilers, the following is eliminated: "And if, in addition to the double riveting of such seams, the rivet holes are fairly drilled, instead of punched, an addition of twenty-five per centum to the working pressure for single riveting may be allowed." One hundred and twenty pounds pressure per square inch is the maximum permitted for boilers made of iron, and 130 for boilers made of steel.

The part of section 41 relating to the right and duty of Inspectors to examine every foreign ocean-going vessel which leaves our ports, is stricken out. In section 46, where the requirement of signal lights upon steamers, with or without tows, is made, the following is added: "Any steam vessel with fixed lights, under way, seeing the lights of another vessel approaching, where her own lights cannot be seen, shall exhibit or wave a white light until such vessel has passed." This same addition is put in the regulations for the carrying of signal lights by sailing vessels.

Section 49 requires the sailing master to give a bond for the forfeit of \$100 in case of carrying an excess of passengers or neglecting to keep a proper list of their names.

Section 60 raises the price of every certificate granted by the Inspectors to each captain, chief engineer, and first-class pilot from \$5 to \$8, and each renewal from \$3 to \$4. It is provided in the bill that "fog-horns required by the provisions of this act shall be such as can be heard at a distance of at least one and a half miles in still weather."

Estimating Brick in Furnace Lining.

By FRANK FIRMSTONE, M.E., Glendon, Pa.

In lining blast furnaces, it is customary to use two or three sizes of tapered brick, and as these will lay each one only to a certain radius, courses which have other radii are formed by using brick with parallel sides, along with the tapered ones, the object being to keep the joints, as nearly as possible, in a radial direction. In ordering brick for a furnace lining, it is of course necessary to find how many of each kind are needed, as well as the total number required. For the sizes of brick we use, I have found the method described below, convenient. A little examination will show that the question does not admit of a direct solution. We use the following sizes of brick:

No. 29,	6" small end,	7" large end.
" 6,	6" " " " 8" " "	
" 30,	7" " " " 7" " "	
" 20,	6" " " " 6" " "	
" 21,	4½" " " " 4½" " "	

All are 14" long, and 6" thick. No. 6, turns a circle 3' 6" radius. No. 29, one of 7"; No. 21, is used only for the last brick in courses which do not come out nearly a whole number of brick of the other sizes; one per course is a sufficient allowance. A close enough approximation is got by dividing the whole height of the furnace into zones of 3' or 4' high, determining the brick necessary for a course, the radius of which is the mean radius of the zone, and multiplying the result by the number of courses in the zone for the total number required in it. If we call the radius of a course, or the mean radius of a zone, the brick for which we wish to determine, r , and the length of a brick l , the outside radius of the ring of brick work will be $r+l$. Then, since the lengths of arcs, of different radii, subtending the same angle, are to one another as their radii; if t be the length of any arc on the inside circumference of the course, t' the length of the corres-

ponding arc on the outside circumference, we will have: $t' = \frac{r+l}{r} t$. Now to

make the last joint in a series of brick, run in the direction of a radius, we must find a combination of sizes, such that the length occupied by them on the inside circumference (t), and also the corresponding length on the outside (t') may both (nearly) correspond to a whole number of brick. It is evident also that as all the brick in the above list measure a whole number of inches on the large end, in

using them t' must be (nearly) a whole number of inches, say within 0.1", and we need not examine further any value of t' which does not fulfil this condition.

Example: Let the mean radius of a zone 3' high be 4' (48"), then, $r+l = \frac{48+14}{8} = 1.29$. The radius being more than 3' 6" and less than 7', we

know that we must use No. 6 brick, and also some 29's, 30's, 20's. (If the radius is 7' or more, it is evident that no 6's can be used.)

For a first trial, take 6 brick, then $t=6"x6=36"$ and $t'=36x1.29=46.44"$.

This differs from the nearest whole number (46) by 0.44", more than the limit of variation fixed above.

For 5 brick: $t=6"x5=30"$ and $t'=30"x1.29=38.70"$, which is still too far from a whole number.

Take $t=31"$, which we may make up thus: 4 brick 6"=24" and 1 No. 30, 7"=total 31", and $t'=31x1.29=39.99$ say=40".

Now we have for the outside: 1 No. 30=7", 4 brick=x; then $7+x=40"$ and $x=33"$.

But 4 No. 6=8"x4=32", 1" less, hence 1 No. 30 to 4 No. 6, is too many, and we must try a greater number of brick.

For 13 brick $t=13x6=78"$ and $t'=78x1.29=100.62"$.

Not near enough to a whole number. For 12 brick, 6" on small end and 1 No. 30, $t=12x6+7=79"$; $t'=79x1.29=101.91"$, say 102" (nearest whole number.)

For the outside we have: 1 No. 30=7" and 12 brick=x. Then $7+x=102$ and $x=95$. This we can make up thus: 11 No. 8@8"=88" and 1 No. 29=7"=95".

For every 13 brick therefore we require: 1 No. 30, 1 No. 29, 11 No. 6.

Now the circumference of a circle 4 ft. radius is 25.1' and to lay it will require 50 brick (counting all the brick 6" on the small end) say: 4 No. 30, 4 No. 29, 42 No. 6, total brick, 50.

And the zone will take (since it contains 6 courses in height): 24 No. 30, 24 No. 29, 252 No. 6, total brick, 300.

It is convenient to draw a section of the furnace on one page of a sheet of paper, to rule the opposite one into columns for the different sizes of brick, and then to write the numbers for each zone opposite to it; a glance then shows what brick are needed in each part of the furnace. I have counted the brick in different zones, and find that they agree very nearly with the numbers previously found by the above plan, near enough at least to get the proportional numbers in the whole lining. The same method may be used for brick of any other sizes, but if the ends do not measure whole numbers of inches, of course the work will be rather more troublesome.

NOTE.—To find the radius to which a given size of brick will lay:

Taper: length :: small end: radius.

Example. No. 6 brick: Large end 8", small end 6", taper 2" length 14".

$2:14::6:x$

$x=42'=3' 6"$

—Polytechnic Bulletin.

Clayton Valley, Nevada.

[A Paper, read before the Thayer Club, at West Point, by Lieut. DAVID A. LYLE, Second U. S. Artillery.]

THIS little valley is situated in Esmeralda County, Nevada, in latitude 37° 48' N. and longitude 117° 35' W. from Greenwich. It is one of those smaller interior basins, constituting component parts of that vast arid area, known as the Great Basin, which lies cradled between the Rocky Mountains on the east and the bold Sierras on the West. Our preconceived ideas of the Great Interior Basin, formed from the earlier maps of that region, when it was comparatively unknown, were very erroneous.

Upon these maps it was delineated as an immense sandy desert, the greater part apparently level, and inhabited by a race of Indians in the lowest stage of degradation, who subsisted upon roots, insects and reptiles; and to whom the general appellation of Diggers was applied. Modern topographical explorations and researches have dispelled, to a great extent, the misty veil and mythical clouds which for so long a time enshrouded this terra incognita. They have shown that this great area is not one immense waste, but is broken up into numerous lesser basins by longitudinal ranges of mountains, the general trend of which is from north-west to south-east. These ranges preserve a remarkable parallelism and gradually diminish in altitude from the Sierras eastward to the Wahsatch Range.* They appear to have been formed by the gigantic upheaval of the earth's crust by subterranean agencies, and to have been propagated eastward with a constantly and uniformly diminishing wave-intensity, preserving throughout its undulatory motion, the ridges or summits being the crests. The erosive action of atmospheric forces, aided by time and gravity, has abraded great quantities of earthy material and carried the debris into the depressions between these crests, filling them up and forming numerous valleys of varied extent. These are again subdivided into smaller basins by lateral spurs, jetting out from the sides of the north and south chains of mountains. The distinguishing and characteristic feature of these basins is the absence of any visible outlet for their waters. The water seeking its level, descends to the lowest part of the valley and comes to rest in what are denominated "sinks."

* We think this statement is not strictly correct. The altitude diminishes eastward from the Sierras until Smoky Valley has been passed, and then, if our recollection is correct, increases again, towards the Wahsatch. Hence Lieut. LYLE's figure of a wave loses some force. Indeed, it is not strictly consistent with the fact that in most of these ranges the axes of upheaval are not parallel with the axes of the ranges. The successive peaks stand *en echelon*.—Ed.

In the larger valleys, the "sinks" take the form of small lakes whose waters are strongly impregnated with alkaline matter, potash, soda, borax, etc. In the smaller, the water extends superficially over a considerable area with a slight depth, and during the dry season evaporates, leaving behind a very hard level surface, known as dry lakes, or more generally, "alkali flats." These beds are almost perfectly white and so indurated as barely to retain the trail of a shod animal, while the lurid glare of the sun reflected from their surfaces has a brilliancy so dazzling as to be scarcely tolerable to the eyes. Some, however, never harden, except around the edges, or, at most, are covered with a tough envelope or crust, the treacherous surface of which lures the unwary traveller and his steed onward only to plunge them into deep and viscous mires.

Some contend that these land-locked lakes have a subterranean outlet. This may be possible, but does not seem probable. Taking the superficial contents of any one of these basins, for instance, and considering the limited amount of snow- and rain-fall, when compared with like areas east of the Rockies, or west of the Sierras; also observing the mean daily surface evaporation per square foot during the whole of their long, dry and intensely hot summers, it appears that the surface evaporation fully accounts for the disappearance of the aqueous element in this region, and that in the process of evaporation the alkaline constituents become crystallized and are precipitated in the form of the many soda lakes, salt-marshes and borax beds so frequently found there. The limited range of meteorological observations made, tends strongly to bear out the truth of this hypothesis.

Let us now direct our attention to one of the most interesting of these basins, and the most fertile in materials for study that the seeker after physico-geographical knowledge could visit. Clayton valley, the one we have chosen as the subject of our present sketch, is the most perfect type of the class to which we have alluded above. It is 18 or 20 miles long, and from 8 to 15 miles wide, with its major axis lying nearly north and south. Leaving Desert Wells, Nevada, our route lay in a south-easterly direction across a dry alkali lake about 10 miles long, perfectly hard, compact, and utterly destitute of vegetation, except a few dry sage bushes which surmounted the sandy hummocks near the northern end. Not an obstruction, nor an object, marred the white, glistening surface, which was as level as a floor. This is the southern terminus of the Great Smoky Valley desert. Its stillness and desolation were oppressive. Solitude reigned supreme; not a breath of air stirred; not even the rustle of a lizard, that invariable concomitant of the desert, distracted the attention—a feeling of awe involuntarily crept over one, and almost hushed the labored beating of the heart, as the eye vacantly gazed upon the inanimate scene, and busy thought ran back to the ages when nature was convulsed by the action of those terrific forces, the fury of which was, in part, spent upon this corrugated landscape. To our left and rear, towered aloft the sharp, bald granite peaks of Lone Mountain; to our right and front, loomed up the Red Mountains, crowned by a few stunted cedars; and in our rear, the sides of the Toyabe range bade us farewell.

We then came upon a series of undulating hills and low mesas, the surfaces and sides of which were furrowed with innumerable gullies and small cañons. The whole face of the country was covered with volcanic remains—sharp, broken rocks, so blackened as to appear as if the whole area had been swept over by a terrible fire. Ascending a little cañon we crossed the "divide" and entered the head of a deep gully, when we suddenly came upon an old crater, which retained a portion of its conical form. Passing this, we met with foot-hills of a dark reddish-brown and yellowish hue; and just beyond, we were attracted to one side by a greenish mass, which proved to be native sulphur and alum, near the surface. All around were strewn white, chalky-looking lava, pumice and beds of white volcanic ashes. A little farther on, the appearance of the ground changed to an ashen hue, covered with broken rocks, with here and there a diminutive cactus.

Suddenly the black, truncated cone of an extinct volcano greeted our eyes, distant about five miles. Our route now lay over scoria, obsidian, and a greyish lava, which clearly indicated the igneous agency that had fashioned the physical contour of the surface. As we advanced, the crater, which had an altitude of about 200 feet, and which had before appeared perfectly black, changed to a dark reddish-brown, closely resembling over-burned brick. The exterior slopes were composed of scoria, lava and slag, often in huge globular and elongated masses, that clearly bore the impress of their former liquid state and the manner of their deposition. The molten element had risen from the seething depths of its subterranean caldron, seeking relief from the frenzied turbulence beneath, which lashed the restless vortex into fury; boiling up till it overflowed the narrow rim of the crater—then, breaking off into more or less striated fragments, rolled down the exterior. The fiery liquid, at no very remote period, had burst asunder the walls of its conical prison and escaped in a large glowing river of lava, running to a distance of three or four miles in a south-easterly direction toward the lower part of the valley. At the lower extremity of this lava-flow, as it gradually cooled, the current had become more sluggish, and the onward motion being arrested, while the posterior pressure from the melted current still continued, caused the lava to pile up, as it were, into one or more black buttes much resembling the spoil-banks of coal mines.* Leaving the base of this interesting phenomenon of nature, we continued our march towards Silver Peak, our next objective point. On our right lay a barren, rocky plain, cut by numerous dry

* Lieut. LYLE seems here to forget what he has already noticed, that the whole surface of the country for the distance of many miles, is covered with fragments of lava, etc. Is it not probable that the black buttes here, as in many other localities, are merely the remains of an overflow that once covered a large area? That was our own impression when we visited the locality. The "piling up" theory seems too steep! Ed.



washes and gullies; its surface sloping up gradually to the Red Mountains on the west and south-west. To our left and front lay the large salt-marsh forming the basin of Clayton valley, its white saline surface broken by two or three rocky buttes, like islets in a lake; indeed, so natural and perfect is the insulated appearance, that the largest is called Goat Island, from its close resemblance to the island of that name [Yerba Buena Island, known in common parlance by the above name,] in San Francisco harbor.

As we descended to the edge of this salt basin, we beheld the most wonderful appearance of mirage that we had yet seen. The heat of the sun was of a glowing intensity, the air perfectly calm, and the white heated surface of the marsh seemed transformed into a cool, limpid lake of surpassing beauty, whose banks were covered with green trees and fringed with ever-verdant shrubs and grass. The black, rocky buttes stood out clearly and well defined above the lucid waters, beneath whose placid surface one longed to plunge one's heated body, and lave one's weary, aching limbs in the scarcely perceptible ripples of this phantom lake. Of course, one knew this apparition to be an optical illusion, but so perfect was the semblance that it was difficult to be persuaded that it was not a reality. The warm springs next claim our attention. These are situated near the western side of the salt-marsh and near the foot of a spur of the Red Mountain range. There are some eleven, of note, in number, scattered along the margin in a line nearly north and south, and about one half mile in length. Beginning at the southern extremity of this line, we find a cluster of springs, the largest being Saturn—why so called, I know not, unless it be from the accidental circumstance that the smaller ones are arranged around it in a manner quite analagous to the gorgeous array of satellites that accompany that magnificent planet through its celestial pilgrimage. These springs are in close proximity to each other and flow out upon a level area some twenty or more acres in extent, covered with a rank growth of coarse salt grass—which furnishes very little nutrition to animals, and is not relished by them—whence they flow into the salt-marsh. Proceeding northward, we next meet with three salt springs arranged in the form of an isosceles triangle, differing widely in temperature and the degree of their saturation. These are situated in the edge of the salt-marsh, the two forming the base being in an east-and-west line, 20 feet apart.

The more westerly one has a temperature of 79° Fahr., while the other one in its quiescent state has a temperature of 117°8 Fahr. and at irregular intervals boils and emits steam. The third, forming the apex of the triangle, and lying 90 feet north, has a temperature of 116°5 Fahr.

Still farther north are two more salt springs, situated also in an east-and-west line, only four feet apart. The westerly one, as before, having the lower temperature, being 79° Fahr. while the other has a temperature of 117° Fahr. Another spring, about one-fourth of a mile north of the others, was constantly boiling and emitting steam—a gurgling noise could be heard in several places near the main opening, under the tufaceous crust of calcareous matter deposited by its waters. These latter were impregnated with soda, lime, borax and probably other ingredients. We had no thermometer that would indicate its temperature, but it is above 130° Fahr., as it broke instantaneously the bulb of a thermometer of which that was the maximum reading.

In the immediate vicinity of the hot springs were found numerous concretions, either on the surface or slightly imbedded. These had generally a prolate spheroidal form, although many eccentric shapes were seen. About half a mile out in the salt-marsh was a remarkable spring nearly 20 feet in diameter. The water rose to the height of several inches above the general surface, and was retained by a ring of earth elevated a foot or so above the terrain and thickly set with tubes, whose verdancy contrasted strangely with the sombre gray around, and gave to it the appearance of a miniature oasis. The water was quite clear and nearly fresh, this latter property was probably only apparent from the contrast, after imbibing the more brackish water of the other springs; its interior cylindrical walls extended to a depth of about five feet, below and under which, as far as could be reached by a pole, nothing like earth could be felt. There appeared to be a subterranean lake beneath the salt-marsh, of which this spring was the only visible portion. As to its depth, we had no means of determining it; the temperature was 69° Fahr. The circumjacent earth was a mere superficial crust, five or six inches thick, which was springy beneath our tread, and breaking through which one sank into the viscous mud. In walking over this area the ground constantly jarred and trembled, thus indicating the elasticity and instability of the indurated envelope. Even on the road near our camp, west of the marsh, when animals travelled over it, a dull, hollow sound was heard, bearing out the hypothesis of the existence of a subterranean cavity. The plain is crossed in two or three places by roads and trails; and should animals get off these, they break through and often become submerged in the mire. At one or two places, shallow trenches or vats have been scooped out and the salt-water collecting and evaporating, leaves the walls and bottoms of these covered with beautiful crystals of pure salt.

On the rocky buttes which rear their crests above this treacherous basin are found corals, trilobites, fossil fish and it is said, other fossil remains. Most of these, however, are found on the one called Goat Island, whose base is chiefly basaltic rock, with tilted strata of slate, capped with limestone.

South of the salt-marsh and near the eastern side of the valley, are two or three sand dunes, almost perfectly white, which are constantly changing their position, sometimes disappearing altogether for a time, only to reappear in another place, subject alone to the wild caprice of the whirlwinds that rear their silvery sands into miniature pyramids, to hurl them broadcast over the desert-plain at the next blast.

[TO BE CONTINUED.]

Product of the Lake Superior Mines and Furnaces.

[From the Marquette Mining Journal, January 17.]

ORE SHIPMENTS FOR 1873.

The following table exhibits in gross and net tons the amount of iron ore shipped from the Lake Superior mines during the season of 1873, together with its total value at \$7 per ton, gross:

Mines.	Gross tons.	Amount.
Jackson	113,892	\$797,246 31
New York	70,882	496,170 80
Cleveland	132,082	924,576 56
Lake Superior	166,666	1,166,663 87
Champion	72,783	509,477 78
Washington	38,016	266,102 78
Republic	105,453	738,170 75
Kloman	21,065	147,456 84
Cascade	20,507	143,551 37
Barnum	48,077	336,535 93
Foster	27,372	191,605 38
Rowland	1,405	9,832 84
Lake Angeline	43,934	307,535 25
Pittsburgh and Lake Superior	21,499	150,400 37
Edwards	31,730	222,111 09
Spurr	31,934	223,535 87
Michigamme	28,967	202,765 84
Michigan (Clarksburg)	3,212	22,484 00
Keystone	10,426	72,984 18
McComber	38,970	272,788 09
Himrod	2,074	14,519 21
Marquette	2,148	15,036 61
Winthrop	33,547	234,826 29
Shenango	8,658	60,608 85
Albion	1,189	8,320 29
Carr	1,656	11,591 59
Bagaley	2,277	8,735 55
Howell Hopcock	1,240	8,676 69
Green Bay	950	6,648 91
Emma	7,138	49,964 44
Rolling Mill	11,319	79,235 31
Saginaw	37,139	259,973 18
Smith	9,329	65,301 81
Grand Central	6,630	46,406 59
Gribben	4,518	31,623 22
New England	180	1,268 28
Allen	510	3,570 00
Goodrich	3,258	22,808 59
Home	1,091	7,036 25
Magnetic	79	550 87
Iron Mountain	113	788 72
Hungerford	145	1,016 37
Total	1,163,057	\$8,141,398 98

PRODUCTION OF THE FURNACES FOR 1873.

The following table shows the aggregate production of the several furnaces in the district, for 1873, together with the value of the iron (\$45) at furnace:

Furnaces.	Gross tons.	Value.
Pioneer	7,098	\$319,440
Collins	2,000	90,000
Michigan	4,467	201,015
Greenwood	4,416	198,720
Bancroft	4,100	184,500
Morgan	6,324	284,580
Champion	3,949	177,705
Deer Lake	3,447	155,115
Fayette	10,696	481,320
Bay	8,760	394,200
Munisig	2,237	100,665
Grace	7,800	351,000
Beecher	710	31,950
Beecher (muck bar)	428	25,680
Lake Superior Company's peat furnace	500	22,500
Escanaba (shipped to November 19)	2,175	97,875
Menominee	2,400	108,090
Total	71,507	\$3,224,235

TOTAL PRODUCT OF THE MINES.

The following table exhibits in gross tons the aggregate product of each mine from 1856 to 1873, inclusive of both:

Mines.	Gross tons.	Gross tons.	
Jackson	1,311,117	Howell Hopcock	1,239
New York	521,662	Green Bay	8,582
Cleveland	1,157,343	Emma	7,137
Lake Superior	1,442,585	Rolling Mill	18,091
Marquette	55,146	Saginaw	56,299
Champion	307,649	Smith	22,773
Washington	346,934	Grand Central	21,384
Republic	116,477	Gribben	4,517
Kloman	21,065	New England	108,990
Cascade	59,747	Allen	9,217
Barnum	175,053	Goodrich	3,258
Foster	101,153	Home	1,090
Rowland	2,278	Magnetic	78
Lake Angeline	339,980	Iron Mountain	16,706
Pittsburgh and Lake Superior	22,658	Hungerford	145
Edwards	152,807	Parsons	1,896
Spurr	31,933	Negaunee	11,687
Michigamme	29,107	Mather	2,288
Keystone	10,426	Franklin	2,007
McComber	83,122	Michigan	4,439
Himrod	2,074	Quartz	718
Winthrop	58,573	Excelsior	756
Shenango	8,855	Williams	477
Albion	2,288	Other small mines	217
Carr	1,673		
Bagaley	5,702	Total	6,671,067

TOTAL PRODUCT OF THE FURNACES.

The following table shows the total product of the Lake Superior furnaces from 1858 to 1873, inclusive:

	Gross tons.		Gross tons.
Pioneer.....	72,695	Bay.....	20,755
Northern.....	16,068	Grace.....	7,800
Collins.....	43,949	Beecher.....	6,652
Michigan.....	31,812	Beecher (muck bar and merchant iron).....	1,427
Greenwood.....	33,768	Lake Superior Company's peat furnace.....	700
Morgan.....	43,315	Escanaba.....	2,175
Bancroft.....	43,351	Menominee.....	2,400
Champion.....	29,515		
Fayette.....	46,181		
Munsing.....	12,294		
Deer Lake.....	14,000		
		Total.....	428,857

TRAFFIC OVER THE RAILROADS.

The iron traffic for 1873 was divided between our two railways as follows:

	IRON ORE.
Over Marquette, Houghton and Ontonagon Railroad.....	659,894
Over the Chicago and Northwestern Railroad.....	503,932

Difference in favor of Marquette, Houghton and Ontonagon Railroad.....	155,162
--	---------

	PIG IRON.
Over Marquette, Houghton and Ontonagon Railroad.....	21,999
Over the Chicago and Northwestern Railroad.....	9,248

Difference in favor of Marquette, Houghton and Ontonagon Railroad.....	12,751
Total ore and pig iron over the Chicago and Northwestern Railroad.....	513,180
Total ore and pig iron over Marquette, Houghton and Ontonagon Railroad.....	681,893

Total shipments by rail.....	1,194,304
With a difference of 168,713 tons in favor of the Marquette, Houghton and Ontonagon Railroad.	

The small excess in our table showing the product of the district is accounted for by ore teamed from one or two mines to local furnaces.

AGGREGATE YIELD OF MINES AND FURNACES.

The following is a statement in gross tons of the aggregate yield of the mines and furnaces in this district from 1856 to 1873, inclusive, together with the value of the same:

	Iron Ore.	Pig Iron.	Ore and Pig Iron.	Value.
1856.....	7,000	.....	7,000	\$28,000
1857.....	21,000	.....	21,000	63,000
1858.....	31,035	1,620	32,664	249,202
1859.....	65,679	7,258	72,937	575,529
1860.....	116,908	5,660	122,568	733,496
1861.....	45,430	7,970	53,400	419,501
1862.....	115,721	8,590	124,311	984,977
1863.....	185,257	9,813	195,070	1,416,935
1864.....	235,123	13,832	248,955	1,867,215
1865.....	996,256	12,283	208,539	1,590,430
1866.....	296,972	18,437	15,409	2,405,960
1867.....	466,076	30,911	496,987	3,475,820
1868.....	507,813	38,246	546,059	3,992,413
1869.....	633,238	39,003	672,241	4,968,435
1870.....	856,471	49,298	905,769	6,300,170
1871.....	813,379	51,225	864,604	6,115,895
1872.....	952,055	63,195	1,015,250	9,188,055
1873.....	1,163,057	71,507	1,234,564	11,365,633
Total.....	6,708,470	428,857	7,137,327	\$55,743,666

Engineering and Mechanical Notes.

THE *Colliery Guardian* describes some new inventions designed to aid the Danks puddler. One of these consists in a rotary squeezer, which divides the ball into any required number of pieces, just before throwing it out. These pieces can then be rolled in an ordinary mill and thus the cost of building special mill plant for the rotary puddler is avoided. The squeezer resembles the ordinary rotary machine in every respect, except that the casing has knives or edges placed on its inner surface, just back of the opening. The revolving cylinder presses the squeezed bloom against these knives which thereby cut up the bloom. The squeezer is mounted on a horizontal axis and a cradle is provided for the purpose of lifting the ball into the squeezer. This is done by an arm or lever fixed at each end of the iron shaft, which passes through the axle of the revolving cylinder, the axle being made hollow for the purpose. These arms or levers carry the cradle, into which the ball is placed when it comes from the puddling furnace. The levers and arms are then raised by means of a small steam cylinder, until the cradle reaches the top of the squeezer, when a small bar, fixed to the cradle, comes into contact with a catch placed upon the framework of the machine for the purpose, thereby tilting the cradle in such a manner as to allow the ball to slide into the squeezer. This mechanical lift is made necessary by the large size of the puddle-balls, and the fact, that the rotary squeezer has a horizontal axis which places the opening at some height.

THE difficulties in obtaining laborers, and the restrictions imposed by the men upon their hours of work, are rapidly altering the position of England in the matter of engineering works. It has been estimated that all new railway works are now costing from 30 to 40 per cent. more than they did a few years ago, and nearly double the time is required to complete them. Where the works are not near to large towns, it is difficult to get men at all, and, as a rule they do not do the same amount of work as formerly. In the important colliery and iron

districts of the North of England there is great difficulty in getting men to do night-work—such as emptying the wagons at the furnaces or filling coke after a certain hour at the coke ovens, and pitmen limit their work in many cases to four days a week. This creates a great difficulty in getting traffic carried, and will, if continued, necessitate an enormous increase in rolling stock, sidings, and engine power, for at present the work got out of a mineral wagon in these districts is little more than two-thirds of what it was three or four years ago. The rapid development of traffic, the difficulties caused by men limiting their hours of work, and the introduction of the block system, have necessitated a remodeling of the old mineral railways in the North of England, which it will take a long time to complete.

In testing flues or chimneys it is necessary to take great care not to put the tube into an eddy of the gas, as is sometimes done, the instrument being made to indicate a pressure outwards rather than a suction. This is very common at the base of chimneys, and therefore it is recommended to conduct the testing twenty or thirty feet from the base. Some results were obtained recently in testing some large flues—six feet in diameter—which showed a very great variation in the speed at various parts of flues. One flue, which was tested downwards every three feet, showed at first a speed of 10.53 feet per second, the highest speed being 29.40 feet, and the speed at the base being 12.70 feet. Another flue, which was tested in a somewhat similar manner, showed at first a speed of 4.04 feet, then in the middle a speed of 12.93 feet, and at the end 4.04 feet. A large horizontal chimney flue, tested every foot, gave speeds ranging from 6.38 feet up to 37.77 feet and down to 12.77 feet, which showed that there must have been a great amount of friction on the sides of the flue. The highest speed just named—37.77 feet—is about as much as one can stand against in the confined space of a flue.

ENGLISH technical papers contain the following new "feat" in working a Bessemer plant: "On Tuesday one of the greatest feats in the history of the production of Bessemer steel was accomplished at the works of Messrs. WILSON and CAMELL, Dronfield, under the superintendence of the manager of the Bessemer department, Mr. JAMES DUFFIELD. The extraordinary number of 48 blows was successfully attained in the course of 24 hours, and from the use of two cupolas only, the amount of steel produced being about 270 tons. Mr. JAMES DUFFIELD and the workmen under him deserve great credit for the performance of a task unprecedented in the Bessemer process. It should be stated that 14 blows in 24 hours is considered a day's work when two cupolas are used."

AN evidence of the great need of improvement in which blast furnace practice in Scotland has stood is given by the results obtained from the new Ferrie self-coking furnace at Dalzell. Witness the following item taken from late English papers and which reads like the little paragraphs which used to float about the societies and press as long ago as NELSON's day. "The furnace gases, which formerly blew into the atmosphere, are now collected, and are found to be sufficient to raise the steam in a range of ten large boilers, thereby saving in gross alone a very large sum of money annually, altogether irrespective of the saving of about 15 cwt. of coal per ton of iron made by the new furnace."

WORK has been commenced on the Centennial Building, in Philadelphia. Within two days after his appointment, the engineer in charge had already broken ground. The engineers' instruments used in the surveys, are of the most approved make, and are furnished by Messrs. HELLER and BRIGHTLY, of 33 North Seventh street, Philadelphia. The telescopes on the transits and levels, made by this firm, are much superior to the old style instruments we have been accustomed to.

THE Cincinnati Southern Railroad Company is asking for tenders for a railroad bridge, either suspension or truss, 1,236 feet long, over the Kentucky River at the mouth of Dix River. The roadway is to be 275 feet above the bottom of the river. Information can be obtained from THOS. D. LOSETT, Engineer, 70 West Third street, Cincinnati, O.

THE business of coking for export is one of considerable dimensions in Belgium. In the first ten months of 1873, 701,000 tons of coke were exported, against 602,000 tons in the corresponding months of 1872. During the same time last year the country shipped 3,582,000 tons of coal to its neighbors.

MR. LEWIS RILEY, of Ashland, has been appointed by the Lehigh Valley Railroad Company, Chief Mine Engineer of the Mahanoy district, embracing all the company's land in this county.

American Machinery in Europe.

MR. A. CARR, of 43 Courtlandt street, New York, has just received by cable an order for another Selden Mining Pump for the Lichtenstein mine, in Saxony. This is the second Selden pump ordered for these mines (the first is working very satisfactorily), showing that our American machinery can well hold its own in competition with European engines. We congratulate Mr. CARR on his success; he makes a good pump, as we know from our own experience, and deserves success. We have all the more satisfaction in announcing these orders, from the fact, that they come directly through the medium of the *ENGINEERING AND MINING JOURNAL*, in which Mr. CARR has advertised his pumps. The high standing and large circulation of this journal abroad, as well as in this country, is largely tending to promote the appreciation of American machinery, of the best class; and those who use our columns for making known their goods, bear gratifying testimony to the advantages derived from so doing.

THE COAL TRADE.

NEW YORK, February 12, 1874.

The programme of the Coal Combination, published exclusively by the ENGINEERING AND MINING JOURNAL, has created much comment and some excitement among dealers and in the trade generally. The great importance of this agreement, as regulating the trade on an entirely new basis, cannot be over-estimated and, naturally, the middle-men, who are ignored in the coal trade of the future, are quite excited over the developments we have made; undoubtedly, the new state of things will cause the retirement of a number of our dealers, since "their occupation is gone."

The important circular which we published last week, announcing that the Delaware, Lackawanna and Western R. R. Co. has virtually abandoned the system of auction sales by making monthly or season contracts for coal at fixed prices, has also had the effect of confirming belief in the strength and power of the combination, for it is generally known that this action was the result of a somewhat excited debate in the recent meeting of the companies, and the point was only conceded after the most strenuous opposition. The fact is, the other companies had last year to go in and buy the Lackawanna coal at the monthly sales in order to maintain prices, and they have become tired of this and, it is understood, advocated the virtual abandonment of the sales with such potent arguments as resulted in the circular referred to.

There was also an animated discussion between the members of the combination on the question of difference in price to be allowed between Schuylkill coal at Port Richmond and Wilkes-Barre coal at Port Johnston. Last year a difference of 65 cents per ton was allowed, to cover the extra freights to eastern ports; this year this difference has been reduced to fifty cents. It is also stated that the Reading Company agrees to charge the same rates of freight by their steam colliers as is charged by sailing vessels, while last year, under certain circumstances, the company made a difference of 20 cents per ton in favor of the consignee.

The course of the ENGINEERING AND MINING JOURNAL in giving such information as is of interest and importance to the trade has met with general and warm approval, though it has also brought out some opposition, as was to be expected. The fullness and accuracy of our market reports, and the large amount of information of interest to our coal and iron industries which we give each week, are recognized in the most flattering manner as placing this Journal far in advance of any other publication in this country devoted to our coal interests.

At the recent meeting of the Lehigh operators it was agreed to accede to "the programme" and to leave to the L.V.R.R. Company the distribution of cars to each colliery that would correspond with the quota called by the committee of six.

Everything is working harmoniously throughout the coal regions now, though many of the mines are still idle.

The consolidation of the Honey Brook and Wilkes-Barre Coal and Iron Companies, last week, is noticed in another place. We have the prices made for season contracts by the new company, the Lehigh and Wilkes-Barre Coal Company, as follows:—"Until the 10th of March next the Company will accept orders from dealers, manufacturers and consumers for Wilkes-Barre coal at the following fixed prices for the year 1874, f. o. b. vessels at Port Johnston, coal to be delivered in equal monthly proportions:

Lump, \$4 70; steamer, \$4 80; broken, \$4 90; egg, \$5 05; chestnut, \$4 50 per ton of 2,240 lb. This Company now controls, by purchase or lease, the mines heretofore operated by the Lehigh Coal and Navigation Company, the Wilkes-Barre Coal and Iron Company and Honey Brook Coal Company, and is prepared to contract for the delivery of these coals.

There is a somewhat more active inquiry for coal, principally for the eastern market and for manufacturers, Lehigh and Pittston being in most demand. Though business even in these cannot be considered good, yet it is reported by several of our large dealers as fully up to the average of last year at the same time. Prices are shaded down from the quotations we give below to approximate the opening prices in March, which are for Wilkes-Barre coal, f. o. b. at Port Johnston: Lump, \$4 55; steamer, \$4 65; broken, \$4 75; egg, \$4 90; stove, \$5 35; chestnut, \$4 35; average \$4 76.

For Lehigh, f. o. b. at Elizabethport or Amboy, the March prices will be—Lump, \$5 40; broken, \$5 35; egg, \$5 35; stove, \$5 40; chestnut, \$4 75.

The line trade has not been quite as good during the past week, though prices are there better maintained since the programme of the combination does not affect prices except at points where the several companies can compete.

In Bituminous coals very little is doing, and there will be little change in this branch of the business for a month yet. The shipment of 248 tons Kanawha splint, which we announced as having been made a few weeks ago, has just been received. As this is the first introduction of this coal in the New York market it is worthy of note. We have no doubt it will become a popular fuel. A shipment of 450 tons has also been made to Boston for gas purposes.

Our usual full market reports from the principal cities will be found below; we will be obliged to any of our readers who will supply any omissions or make any corrections which may suggest themselves as desirable in these reports.

Basin of Wages for 1874 in Schuylkill Co., Penn.

This agreement made and concluded at Pottsville this twenty-fourth day of January, 1874, between the operators of the Schuylkill Coal Region and the Miners' and

Laborers' Benevolent Association by their committees, for the basis for wages to be paid the workmen in the Schuylkill Region, for the year ending December 31st, 1874, witnesseth:

The wages to be fixed upon a basis of \$2.50 per ton at Port Carbon, as a *minimum*.

The wages are to be, outside labor, ten (10) dollars per week; inside labor, eleven (11) dollars per week; miners working by the day, thirteen (13) per week, and contract or yard work to be the same rates as paid in 1873. The wages for day work to be clear of all cost.

All advances are to be at the rate of one (1) cent for every three (3) cents advance in the price of coal above \$2.50 per ton on average at Port Carbon.

The prices of coal for fixing wages shall be obtained as follows: On the first day of each and every month (if the first day should fall upon a Sunday, then the preceding day,) a committee consisting of one representative of the operators and one of the Miners' and Laborers' Benevolent Association, shall meet in Pottsville and draw by lot from a list of collieries shipping over twenty thousand (20,000) tons per annum over the Philadelphia and Reading Railroad, five (5) collieries which shall report to each of the committee on or before the 15th day of each and every month (if the 15th should fall upon a Sunday, then the preceding day) the average of prices obtained for all coal sold by them, excepting pea coal, calculating the same at Port Carbon. The committee appointed as above shall meet on the 15th, and average the prices so reported, which average shall fix the rate of wages for the current month.

Philadelphia and Reading Railroad Co.

OFFICE, 227 SOUTH FOURTH STREET.

PHILADELPHIA February 10, 1874.

Notice is hereby given, that on Monday, February 16th, the tracks crossing Richmond street, at Port Richmond, will be cut for the purpose of excavating for the new sub-grade crossing at that point. No coal can be received at Richmond Wharves during the progress of this work, which, it is expected, will occupy about twenty days from February 16th.

Due notice will be given of the reopening of the line.

FRANKLIN B. GOWEN, President.

COAL PRODUCTION.

Anthracite.

Mined for the week ending February 7, 1874.

Wyoming Region.	WEEK.	YEAR.*
	tons.	tons.
Delaware and Hudson Canal Co.	32,270	164,931
Delaware, Lackawanna and Western RR.	38,183	222,659
Pennsylvania Coal Co.	18,178	106,501
Lehigh Valley R.R.	14,694	89,003
Central Railroad of New Jersey.	13,750	33,204
<i>Lehigh Region.</i>		
Lehigh Valley Railroad.	45,231	273,128
Central Railroad of New Jersey.	5,750	45,520
<i>Schuylkill Region.</i>		
Philadelphia and Reading Railroad.	51,017	200,364
Shamokin and Lykens Valley.	5,950	33,940
<i>Sullivan Region.</i>		
Sullivan and Erie Railroad.	458	2,928
Total.	225,501	1,172,244

* Year beginning January 1st.

Shipments of Bituminous Coal for the Week Ending Feb. 7.

	Week.	Year.
	Tons.	Tons.
Cumberland and Pennsylvania R.R.	17,990	102,390
Cumberland Branch R.R.	2,276	11,353
Philadelphia and Reading R.R.	5,130	32,664
Barclay R.R.	3,707	21,800
Huntingdon & Broad Top R.R.	6,960	37,978
Tyrone Division Penn. R.R.	.....	58,569

MARKET PRICES OF COAL.

Import Duty on Coal.

Anthracite free. Bituminous, per ton of 28 bushels, 80 lbs. to the bushel, 75c., gold.

All slack, or culm, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lbs. per bushel, 40c., gold. Not otherwise provided for, per ton, 40c., gold.

WHOLESALE PRICES.

f. o. b. at Shipping Ports.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
<i>Wyoming Coals.</i>						
Scranton at Elizabethport.	4 60	4 70	4 80	4 95	5 25	4 60
Lackawanna at Rondout.	5 05	5 15	5 25	5 40	5 70	5 05
*Pittston at Weehawken.	4 60	4 70	4 80	4 95	5 20	4 50
Wilkesbarre at Port Johnston.	4 70	4 80	4 90	5 05	5 70	4 50
Newport and Plymouth.	.....	5 35	5 35	5 50	5 80	5 10
Susquehanna Coal Co. at Amboy.	5 25	5 35	5 35	5 50	5 80	5 15
<i>Lehigh Coals.</i>						
Old Company at Port Johnston.	5 85	.....	5 70	5 70	5 85	5 05
Sugar Loaf at Port Johnston.	5 85	.....	5 70	5 70	5 85	5 05
Hazleton at Elizabethport.	5 85	.....	5 70	5 70	5 85	5 15
Honey Brook at Elizabethport.	5 85	.....	5 70	5 70	5 85	5 15
Spring Mt. C. Co. at Hoboken.	5 85	.....	5 70	5 70	5 85	5 25
Beaver Meadow at Port Johnston.	6 05	.....	5 70	5 70	5 85	5 25
McNeal at Port Johnston.	5 85	5 85	5 70	5 70	5 85	5 15
<i>Schuylkill Coals at Port Richmond.</i>						
Schuylkill White Ash.	4 60	4 60	4 70	4 70	5 00	3 95
Schuylkill Red Ash.	.....	4 70	4 85	5 15	3 95	.....
Shamokin W. and R. Ash.	.....	4 80	5 00	5 20	4 10	.....
N. Franklin.	.....	5 20	5 20	5 10	4 00	.....
Lorberry.	.....	5 50	5 50	5 50	4 35	.....
Lykens Valley.	.....	6 10	6 10	6 10	4 75	.....

*Ex-commission.

WHOLESALE PRICES.

New York.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
<i>Wyoming Coals.</i>						
Scranton	5 05	5 15	5 25	5 40	5 70	5 05
Lackawanna	5 55	5 05	5 75	5 90	6 20	5 55
Pittston	5 00	5 00	5 10	5 10	5 60	4 90
Wilkesbarre	5 25	5 35	5 25	5 50	6 15	4 95
Newport & Plymouth	.....	5 80	5 95	5 95	6 25	5 55
Susquehanna Coal Co.	5 65	5 75	5 80	5 95	6 25	5 60
<i>Lehigh Coals.</i>						
Old Company	6 30	.....	6 15	6 15	6 30	5 50
Sugar Loaf	6 30	.....	6 15	6 15	6 30	5 50
Hazleton	6 30	.....	6 15	6 15	6 30	5 60
Honey Brook	6 30	.....	6 15	6 15	6 30	5 60
Spring Mount Coal Co.	6 30	6 35	6 35	6 35	6 30	5 70
Beaver Meadow	6 50	.....	6 35	6 35	6 45	5 70
McNeal	6 30	6 30	6 15	6 15	6 30	5 60
<i>Schuylkill Coals.</i>						
Schuylkill White Ash.	6 05	6 05	6 15	6 15	6 45	5 40
Red Ash.	.....	6 15	6 25	6 25	6 60	5 25
Shamokin W. & R. Ash.	.....	6 25	6 45	6 45	6 65	5 55
North Franklin.	.....	6 05	6 65	6 65	6 55	5 45
Lorberry.	.....	6 05	6 95	6 95	6 95	5 80
Lykens Valley.	.....	.....	8 80	8 80	8 80	7 45

Bituminous.

WHOLESALE PRICES.

Broad Top	\$6 50
Derby	6 50
Kittaning	6 50
George's Creek Cumberland	7 25
West Virginia Gas	8 75
Penn. Gas	9 00
Westmoreland Gas	9 00
Sterling Ohio	10 00
Straitsville (Ohio) Canal	13 00

RETAIL.

PER TON OF 2000 LBS.

Liverpool House Orrel, delivered	\$20 00@22 00
Liverpool House, Canal, delivered	20 00@25 00
American and Block, delivered	16 00@
Straitsville Canal	16 00@

	Grate and Egg.	Stove.	Chestnut.
Pittston Coal, in yard	\$5 60	\$5 80	\$5 00
Delaware & Hudson, in yard	6 00	6 25	5 75
Scranton, delivered	6 75	7 00	6 25
Wilkesbarre, delivered	6 75	7 00	6 25
Lehigh and Locust Mountain, del'd	7 00	7 50	6 50

Atlanta, Ga.—Jan. 19.

Bituminous Coal by car load, per bushel.....35c.@40c.

At Georgetown, D. C., and Alexandria, Va.

George's Creek and Cumberland f. o. b. \$4 60@4 75, wholesale.

Buffalo, N. Y.

Youghiogheny Gas Coal	\$6 00
Catfish Lump	4 75
" Nut	3 50
" Nut and Slack	3 00
" Slack	2 85
CConnellsville coke	8 00
Beaver Gas Coal	6 50
Anthracite, per 2000 lbs. in cars; retail prices, delivered, \$1 50 per ton additional.	
Lump	\$6 50
Grate	6 00
Egg	6 25
Stove	6 50
Chestnut	6 25

Baltimore.

Wholesale Prices to Trade.

Wilkesbarre, by cargoes or cars	\$6 25@
Pittston and Plymouth	6 00@6 50
Shamokin Red or White Ash	6 00@6 25
Lykens Valley Red Ash	6 80@
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 75@5 00
West Va. Gas Coal f. o. b. at Locust Point	6 50@
Kanawha Canal, coarse	13 00@
Tyrone	7 25@
Ritchie Mineral of West Virginia	19 00@
Retail, per ton 2240 lbs. Delivered, 50 cents additional.	7 10@8 00

Hoston, Mass.

There is no change in the condition of the coal market this week. Prices remain as below:

English Canal	\$26 00@28 00
do do from ship	22 00
Scotch Canal	18 00@20 00
Lingan	8 25
Caledonia	7 75
Pictou	8 25
Sydney	9 00
Acadia	6 75@7 25
Cumberland	7 65@8 00
Anthracite, retail	8 50@9 00
by cargo	7 50@8 00

Chicago, Ill.

REPORTED BY RENO & LITTLE, COAL MERCHANTS.

CHICAGO, Feb. 10, 1874.

Sales light; stocks ample; weather mild; anthracite firm.

Lehigh Lump	\$11 00
Lehigh prepared	10 50@11 00
Lackawanna, Wilkesbarre and Pittston	10 00

BITUMINOUS.

Briar Hill and Erie	8 00@8 50
Walnut Hill (West Va.)	8 00@8 50
Midway (West Va.)	8 00@8 50
Canal	9 00@10 00
Blossburg	9 00
Indiana Block	9 00
Hocking "Brooks"	6 50
Wilmington and Illinois	5 00

Cincinnati, O.

The market continues steady, with moderate consumptive trade.

Ohio River, per bushel	8 c.
Pittsburgh " ton	11c.
Anthracite " ton	\$11 00
The following are retail prices delivered:	
Ohio River, Pomroy, per bushel	12 c.
Kanawha	13 c.
Pittsburgh	12 c.
Canal	24 c.
Youghiogheny	14 c.

Cleveland, O.
Youghiogheny, f. o. b., per ton... \$5 25
Briar Hill... 4 50
Massillon... 4 00
Massillon nut... 3 50
Chippewa... 4 00
Hocking Valley... 3 75
Morris... 4 00
Cleveland Lump... 3 50
Silver Creek... 4 00
Anthracite, prepared... 10 00
Anthracite, lump... 11 00

Detroit.
The market is steady and in moderate demand. The following are present quotations:
Lehigh Lump, per ton... \$11 00
Lehigh nut... 10 00
Scranton, various sizes... 9 50
Blossburg... 9 50
Willow Bank... 8 00
Briar Hill... 8 50
Brookfield... 8 75
Chippewa... 8 00
Massillon... 8 00
Straitsville... 5 50
Nut... 4 75

Indianapolis.
Per 2000 lbs. WHOLESALE.
Brazil Block... \$5 00
Highland... 4 40
Brazil nut... 3 60
Slack Coke... 2 50
Virginia Cannel... 9 00
Indiana Cannel... 7 20
Steam Nut... 3 00
Hocking Valley... 6 00
Gas Coke per bush... 14 c.
Pittsburgh... 7 00
Sand Creek... 5 00
Anthracite... 12 00
Anthracite, per ton, delivered... \$10 00@10 50
afloat... 9 00@

Louisville, Ky.
Pittsburgh, afloat... per bushel, 11 cents.
retail... 16 "
Kentucky... 13 "
Indiana and Peacock Pomroy... 14 "
Anthracite, per ton, delivered... \$10 00@10 50
afloat... 9 00@

New Orleans, La.
The coal supply is equal to the demand. Stock at the Willow Grove Landing on 1st inst., 138 boats, 19 barges; the consumption during January, 26 boats and 6 barges, and 2 French creeks; arrived, 4 boats and 13 barges. Mount Carbon coal is in active demand at 80 cents per bbl., retail, and 47 cents wholesale. We quote:
Pittsburgh, wholesale, per bbl... 45c.@50c.
at retail... 75c.
per hhd... 57 00
per box to steamboats... 50c.@55c.
to manufacturers... 60c.@65c.
Virginia cannel, per bbl... \$1 25
Anthracite, per ton... \$13 00

Philadelphia.
The demand has been up to the average, and prices remain the same:
ANTHRACITE.
Broken, in the yard... \$5 50
Egg and Stove... 5 75
Chestnut... 4 75
BITUMINOUS.
Pennsylvania and Westmoreland Gas... 7 50
Broad Top... 5 25
Powelton Sterling... 5 25
Derby... 5 50
75 cents per ton additional for delivery.

Pittsburgh, Pa.
The proposed consolidation of the Connellsville coal operators noticed by us last week, has not resulted in any definite arrangement as yet. There is a moderate demand for coal, and prices are as follows, with no inclination to make contracts for future delivery of coke at these figures:
Connellsville coal... per ton, \$2 00@2 25
Youghiogheny, at Pittsburgh... 2 25
Youghiogheny, at the mines... 2 00
Coke on cars... 3 25
Castle Shannon on Platform... per bushel, 9 1/2 c.
Anthracite, nut... 7 25
broken... 7 50
egg... 7 50
stove... 7 50
broken on cars... 6 75
stove... 7 00

San Francisco.
From Commercial Herald, Feb. 5.
Imports from Jan. 1 to Feb. 1:
Tons. Tons.
Anthracite... 885 English... 1,005
Australian... 4,735 Vancouver... 5,688
Coos Bay... 4,178 Bellingham Bay... 3,130
Cumberland... 134

Arrivals recently have been inconsiderable, with no important changes to record; in fact, no transactions of moment have been brought to our knowledge. Prices remain nominally as for some time past. There is very little stock here in first hands. Supplies from the north are liberal, including Coos Bay, Anthracite and Cumberland are in moderate supply, jobbing at high figures. We quote:
West Hartley, wholesale, ex ship... per ton, \$13 00
Wallsend... 12 00
Australian... 11 00@11 00
Coos Bay... 11 00
Nansimo... 11 50
Bellingham Bay, ex ship... 8 50
Mt. Diablo, coarse... 8 25
fine... 6 25
Anthracite... 16 00@17 00

St. Louis, Mo.
Per 2000 lbs.
Anthracite, delivered... \$13 50
Illinois coal, retail... per bushel, 10@14 cts
manufacturers... 9@13 "

Big Muddy... 14@18
Trenton... 12 1/2@16
O'Fallon... 10@14
In East St. Louis prices are 4 cents less.

Toledo.
Grate... \$9 00
Egg... 9 00
Stove... 9 00
Chestnut... 9 00
Lehigh Lump... 11 00
Blossburg... 6 50@9 00
Briar Hill... 7 00
Bituminous... \$4 50 to 6 50 as per quality.

Haltax, N. S.
Sydney Coal, per chaldron... \$8 50@9 00
Victoria... 7 00@8 00
Gowrie... 7 50
Little Grace Bay... 7 50
Albion (at Cunard's wharf)... 7 50

Toronto.
Scranton, all sizes, per ton... \$7 50
Lehigh prepared... 8 50
Lump... 9 00
Bituminous... 7 50
Blossburg... 7 00

Montreal.
Scotch Steam, 2000 lbs. ex yard... \$8 00@8 50
Lower Port, do... 7 00@8 00
New Castle Grate, ex yard... 9 00@11 00
Welsh Anthracite, per 2000 lbs... 9 00@10 00
English Coke... 9 00@9 50
Lump Lehigh, per 2000 lbs... 9 00@9 50
Grate... 8 00@—
Egg, American Anthracite... 8 75@—
Stove... 9 00@—
Chestnut... 8 50@—

Provincial.
Block House, f. o. b. at Cow Bay... \$2 50 \$1 25
Gowrie... 25
The shipments from the Provincial Ports have ceased for the season, and will not be resumed before next Spring. Our quotations, therefore, are merely nominal.
Coarse. Slack.
Culm of Coal.
Pictou... net \$3 00 \$1 50
Sydney... 3 25 1 00
Lingan... 2 75 1 00
Caledonia... 2 75 1 25

FREIGHT RATES ON COAL FROM PHILLIPSBURG TO POINTS ON RAILROADS IN NEW JERSEY.

Central Railroad of New Jersey.
Springtown... \$0 55
Bloumsbury... 65
Valley... 75
Asbury... 85
Hampton... 90
Junction... 90
Glen Gardner... 1 00
High Bridge... 1 05
Annandale... 1 10
Lebanon... 1 20
White House... 1 25
North Branch... 1 35
Raritan... 1 45
Somerville... 1 45
Neshanic... 1 70

From Mauch Chunk, \$1 15 additional.
Upper Lehigh, 1 74
Ashley, 2 04

Delaware, Lackawanna and Western Railroad—Morris and Essex Division.

Stewartsville... \$0 60
Broadway... 60
Washington... 75
Port Murray... 90
Hackettstown... 1 00
Waterloo... 1 15
Andover... 1 95
Newton... 2 25
Stanhope... 1 20
Drakesville... 1 25
Chester... 1 80
Ironia... 1 75
Succasuna... 1 55
Vanatta... 1 55
Port Oram... 1 40
Dover... 1 40
Rockaway... 1 50
Denville... 1 60

Pennsylvania Railroad—Amoy and New York Division.

Jersey City... \$2 61
Newark... 2 88
Waverly... 2 42
Elizabeth... 2 36
Linden... 3 30
Kahway... 2 26
Uniontown... 2 20
Campbell's... 2 12
New Brunswick... 2 02
Voorhees... 2 30
Middle Bush... 2 34
East Milstone... 2 40
Dean's... 1 88
Monmouth Junc... 1 82
Rocky Hill... 2 14
Plainsboro... 1 74
Princeton Junc... 1 72
Princeton... 1 08
Lawrence... 1 64
Morrisville... 1 54
Tullytown... 1 66
Bristol... 1 74
Schenck's... 1 80
Cornwell's... 1 84
Torresdale... 1 88
Holmesburg Junc... 1 04
Holmesburg... 2 16
Rowlands... 2 18
Bustleton... 2 22
Frankford... 2 02
Kensington... 2 08
South Amboy... 2 22
Mantau... 2 16
Old Bridge... 2 06
Spotswood... 2 02
Jamesburg... 1 94
Englishtown... 2 08
Manalapan... 2 10
Freehold... 2 16

Twenty cents per ton less when 5 cars at a time are consigned to one party, provided that where the reduction makes the rate \$1 a ton, or less, the rate will be \$1.

Pennsylvania Railroad—Belvidere Division.

Manunka Chunk... \$1 00
Belvidere... 92
Hutchinson's... 76
Martin's Creek... 67
Warren... 67
Carpenterville... 67
Fdingers... 67
Riegelsville... 67
Holland... 76
Milford... 90
Frenchtown... 1 00
Tumble... 1 10
Point Pleasant... 1 15
Bull's Island... 1 20
Prallsville... 1 25
Stockton... 1 25

Twenty cents per ton less when 5 cars at a time are consigned to one party, provided that where the reduction makes the rate \$1 a ton, or less, the rate will be \$1.

The rate of freight, including wharfage and shipping expenses, from Mauch Chunk to South Amboy, Elizabethport, Port Johnston and Hoboken, is \$2 46.
Rate of freight from Mauch Chunk to Newark, \$2 47: to Philadelphia via North Pennsylvania RR., \$2 00.

Philadelphia and Reading Railroad.

RATES OF FREIGHT FROM SCHUYLKILL HAVEN.
Landingville... \$0 50
Auburn... 54
Port Clinton... 71
Hamburg... 81
Shoemakersville... 86
Mohrsville... 88
Leesport... 92
Tuckerton... 96
Reading... 1 04
Exeter... 1 14
Birdsboro... 1 18
Monocacy... 1 20
Douglasville... 1 24
Pottstown... 1 31
Limerick... 1 40
Aramingo... 1 42
Royer's Ford... 1 43

From Mt. Carbon, 7 c. per ton additional.
Port Carbon, 8 "
Tamaqua, 15 "
Pine Grove, 20 "
Chestnut and Pea Coal 25 c. per ton additional, unless released by shipper.

Ithaca and Athens Railroad.

RATES OF FREIGHT FROM STATE LINE.
Factoryville... \$0 10
Spencer... 70
Newfield... 85
Bingham... 40
North Spencer... 75
Vanettenville... 0 60
West Denby... 80
Ithaca... 75
Ithaca for reshipment... 53
Strattons... 85
Rate from Lackawanna Junction to State Line, \$2; for shipment, \$1 34; for all points on I. & A. & Cayuga Lake Railroad, \$2.
Rate from State Line to Cayuga Bridge, for Rochester and Charlotte, \$1 02; Buffalo, 93c.; for all other points on New York Central Railroad \$1 06; Cayuga Bridge, local, \$1 44.
Through rate from L. & B. Junc. to Buffalo, via I. & A. C. L. Railroad and N. Y. C. Railroad, \$3 80; to Rochester as above, \$3 32.

Freights.

Table with 4 columns: PORTS, From Elizabethport, Port Johnston, South Amboy and Hoboken, From Philadelphia, From Baltimore.
Amesbury... 2 25
Bangor... 2 25
Bath... 2 25
Boston... 2 50@2 70
Bridgeport... 2 25
Bristol... 2 90
Charlestown, Mass... 2 25
Chelsea... 2 25
Davenport... 2 25
Derby... 2 25
Dighton... 2 25
East Cambridge... 2 25
Fall River... 1 30
Hacksack... 1 40
Hartford... 1 40
Hoboken... 1 30
Jersey City... 40
Lynn... 2 25
Middletown... 2 25
Mystic... 2 25
New Bedford... 1 40
Newburyport... 2 75
New Haven... 1 50
New London... 1 10
Newport... 1 35
New York... 1 45
Norwich... 90
Pawtucket... 1 15
Portland... 2 00
Portsmouth, N. H... 2 35
Providence... 1 40
Rockport... 2 25
Saco... 2 25
Somerset... 2 25
Sag Harbor... 2 25
Salem... 2 50@2 70
Stamford... 90
Stonington... 1 10
Taunton... 2 25
Warren... 2 25
Washington... 2 25
Wareham... 2 25

Philadelphia rates are nominal, shipments having almost entirely ceased.

TOWING.

We continue our quotations of towing as follows, the rates, however are merely nominal:

IRON MARKET REVIEW.

Import Duties.

The following are the duties in Gold on Iron: Flat Iron, not less than 1, nor more than six inches wide, nor less than 3-8, nor more than 2 inches thick.

NEW YORK, Feb. 12.

The market continues quiet and dull for all descriptions of iron. In American pig some heavy consumptive sales of up-river irons have occurred.

In Old Rails there is some little business at \$40, ex store, for T's. D. H. are not offered.

In Scrap nothing of moment to report.

AMERICAN PIG.

Table with 2 columns: Item (No. 1, Foundry Anthracite, No. 2, Foundry, Grey Forge, White and Mottled) and Price (\$34 00@35 00, etc.).

SCOTCH PIG.

Table with 2 columns: Item (Glenarnock, Coltness, Eglington, RAILS-English (gold), American, at mill, SCRAP-Wrought, Cast) and Price (41 00@42 00, etc.).

CINCINNATI.

We have no change to note in the following quotations:

HOT BLAST CHARCOAL.

Table with 2 columns: Item (Hanging Rock, Tennessee, Alabama, Missouri, No. 1, No. 2) and Price (\$38 00@40 00, etc.).

HOT BLAST STONE COAL.

Table with 2 columns: Item (Missouri, Ohio No. 1, Ohio Forge) and Price (37 00@38 00, etc.).

COLD BLAST CHARCOAL.

Table with 2 columns: Item (Hanging Rock Car Wheel, Missouri, Tennessee, Kentucky, Georgia, Alabama, Machinery and Forge, Blooms) and Price (60 00@66 00, etc.).

CLEVELAND, Ohio, February 10, 1874.

Reported by Messrs. C. E. BINGHAM & Co., Dealers in Pig Iron and Iron Ore, No. 25 West Main street, Cleveland.

During the past week there has been a fair degree of activity in the Pig Iron trade, and although no especial excitement has occurred the market has continued firm and prices have been fully sustained.

The market has been in a very peculiar and unsatisfactory condition for some time past, from the fact that the views of the producers and consumers are so far apart, and, as a natural result, business has been much curtailed.

With the earliest impulse of spring activity, (and the first of March is near at hand) there must be an active demand for iron from all quarters.

No rate has been definitely fixed for Lake Superior ore as yet, but it is supposed that it will be \$9 or \$10, delivered here.

The usual time, four months, is allowed on the following prices for Pig Iron.

AMERICAN.

Table with 2 columns: Item (No. 1, Anthracite Foundry) and Price (\$36 00@36 50).

Table with 2 columns: Item (No. 2, Bituminous, No. 1, Lake Superior Charcoal, No. 1, Grey Forge Bituminous, No. 2, Close Grey, Car Wheel, Charcoal, Car Wheel, High Numbers, No. 1, Massillon Black Band, No. B-1, No. 2) and Price (33 50@34 00, etc.).

LOUISVILLE.

Prices are unsettled, but there is no positive decline to note.

Table with 2 columns: Item (Hanging Rock Foundry, X No. 1, No. 1 Charcoal, No. 2 Foundry, No. 3 or mill, No. 1 stone coal foundry Missouri red short) and Price (\$40 00@41 00, etc.).

CHARCOAL CAR-WHEEL IRON.

Table with 2 columns: Item (Ohio Hecla, No. 1, Red River cold blast, Nos. 3 and 4, Red River and Cottage, Nos. 5 and 6, White Iron) and Price (65 00@, etc.).

TENNESSEE CHARCOAL CAR-WHEEL IRON.

Table with 2 columns: Item (No. 1, Dover cold blast, No. 2, White and Mottled) and Price (56 00@58 00, etc.).

PITTSBURGH.

The market for pig metal has not been active during the past week, and sales were restricted to job lots offered below the current market price.

The following are the quotations at which business has been done during the week:

Table with 2 columns: Item (Gray Forge, Foundry, No. 1, Foundry, Mixed lots) and Price (\$31 00@32 00, etc.).

CHARCOAL HANGING ROCK.

Table with 2 columns: Item (No. 1, Foundry, No. 2, Mill, Mill Mottled, Cold blast mottled, No. 2, Connellsville Coke, No. 1, Foundry) and Price (\$41 00@43 00, etc.).

THE BRITISH IRON MARKET.

LONDON, Jan. 24, 1874.

We are obliged, for want of space, to omit our review of this market, and confine ourselves to giving the following quotations of prices:

Table with 2 columns: Item (G. M. B., at Glasgow, deliverable alongside, Gartsherrie, Coltness, Summerlee, Carnbroe, Monkland, Clyde, Langloan, Calder, at Port Dundas, Glengarnock, at Androssan, Eglington, Dalmellington, Carron, at Grangemouth, selected, Shotts, at Leith, Kinneil, at Boness, Govan, at Broomielaw, Millom, No. 1, Bessemer, No. 2, Bessemer, No. 3, Bessemer, Cleveland, No. 1, No. 2, No. 3, No. 4) and Price (107 6, etc.).

The British Coal Trade.

We give this week a review of the present condition of the British coal trade in the principal mining districts. It is of considerable interest:

Newcastle-upon-Tyne.—The demand for steam and gas coals continues good. The demand for Scotland is below its usual amount. Serious inconvenience is caused by the action of the trimmers and teamers at the staiths of the Northumberland Dock; these men, through their union, having declined to work after five o'clock, under any circumstances, which makes it impossible to carry on trade where the tides and other things have to be considered.

Darlington.—There has been, on the whole, a downward movement since the new year has been entered upon, prices being somewhat easier for manufacturing classes of coals. In some instances, household coals have been sold on slightly lower terms.

Barnsley.—Household coals are very quiet, a fact

scarcely to be wondered at when the present mild weather is taken into consideration. The best Silkstone coal is now delivered in London at 6s. per ton less than at the same time last year.

Rotherham.—There is a good demand for steam coal for locomotive purposes. A moderate quantity of coal is being sent by canal to Hull. The demand for house coal is less than usual, owing to the mildness of the season.

Chesterfield.—Household coals are still quiet, there being no improvement in the tonnage for London. Prices have given way, and so long as the present weather continues a further decline is probable.

Manchester.—For good coal there is a fairly active enquiry with a firm market, but inferior qualities are still rather difficult to move. There is generally a fair demand for house coals. Good furnace coal is in request, and slack is improving.

Wolverhampton.—The coal trade is not brisk, but prices are firm, with no prospects of an immediate recuperation. The price of thick coal west of Dudley is 23s. best; 18s. 6d. common; 17s. 6d. lumps; and 9s. 6d. slack per ton.

Forest of Dean.—Trade is still dull. There has been considerable decrease in the demand, especially from the Cinderford Valley.

Swansea.—There is a good inquiry for every description of coal, both for export and home consumption. Prices are high, and in some cases fluctuate from 1s. to 3s. per ton.

Cardiff.—A good demand for steam coals is still maintained. France continues to be among the principal purchasers of coal obtainable at this port. There is a decrease of activity in house coals, and prices are weaker, but there is still a good business being done at remunerative prices.

Glasgow.—The price of coal is being reduced everywhere, and the wages of the men have been lowered in many cases. Disputes arising from a reduction of 4d. per ton are pending in many places.

Coal Notes.

THE LEHIGH AND WILKES-BARRE COAL COMPANY.

The consolidation of the Wilkes-Barre Coal and Iron Company and the Honey Brook Coal Company under the above title was effected on the 5th inst.

- CHARLES PARRISH of Wilkes-Barre, President. W. H. LILLINGHAST, New York, Treasurer. S. McHENRY, Philadelphia, Secretary. JOHN TAYLOR JOHNSTON, New York, Director. JAMES B. MCCREARY, Philadelphia, " SAMUEL BONNELL, Elizabeth, N. J., " A. M. MUMPER, Bethlehem, Pa., " CHARLEMAGNE TOWER, Pottsville, Pa., " JAMES B. JOHNSTON, New York, "

The capital stock of this Company is fixed at \$10,000,000, which is distributed share for share for the stock of the Wilkes-Barre Coal and Iron Company and the Honey Brook Coal Company. The former of these had a capital of about \$4,000,000, the latter \$3,000,000.

WITH the view of encouraging the more general use of machinery in coal-cutting, the Dudley Mining Institute have offered a prize of twenty guineas for the best model of a hand coal-cutter, that is produced and submitted to the council by next June.

COAL mines have been discovered in the State of Vera Cruz.

It is said Mr. S. H. DADDOW contemplates erecting a large factory in the lower part of St. Clair, for the purpose of manufacturing patent squibs.

AT PHOENIXVILLE, PA., the Schuylkill Copper Works are making from 6,000 to 8,000 lb. ingot copper per week with three furnaces. They are purchasing copper ores in large quantities.

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, Feb. 11, 1874.

The following report from the San Francisco Stock Market is dated the 10th instant: Savage has materially advanced; Raymond & Ely is somewhat higher. These are the only exceptions to a decline of the list.

Table with 2 columns: Item (Savage, Crown Point, Yellow Jacket, Kentucky, Chollar Potosi, Gould & Curry, Belcher, Imperial, Raymond & Ely, Meadow Valley, Fureka V G, Ophir, Hale & Norcross) and Price (114, 90, 70, 22, 70, 22, 87, 6 1/2, 34, 11 1/2, 11 1/2, —, —).

Boston Stock Market.

BOSTON, Feb. 11, 1874.

The following are the bidding prices of copper stocks. There are no material changes:

Table with 2 columns: Item (Calumet and Hecla Co., Copper Falls, Central, Quincy, Ridge, Rockland, Phoenix, St. Clair) and Price (139, 26 1/2, 28, 38, —, —, 2 1/2, 15, 3 1/2).

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D. }
JOHN A. CHURCH, E. M. } Editors:
RICHARD P. ROTHWELL, C. E. }
Editor of the Coal and Iron Department.

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication. It is the Organ of the American Institute of Mining Engineers, and is regularly received and read by all the members and associates of that large and powerful society, the only one of the kind in this country. It is therefore the best medium for advertising all kinds of machinery, tools and materials used by Engineers or their employees.

SUBSCRIPTION—\$4 per annum in advance; \$2 25 for six Months.

ADVERTISEMENTS—The rates are as follows: Inside pages, 25 cents per line each insertion; the outside or last page, 40 cents per line. Payment required in advance.

NEWSDEALERS will be supplied through the agency of the AMERICAN NEWS COMPANY, No. 121 Nassau street, New York City.

COMMUNICATIONS of all kinds should be addressed to the Secretary. The safest method of transmitting money is by checks or Post-office orders, made payable to the order of WILLIAM VENTZ, Correspondence and general communications of a character suited to the objects of THE ENGINEERING AND MINING JOURNAL will always be welcome.

The Postage on THE ENGINEERING AND MINING JOURNAL is twenty cents a year, payable quarterly in advance, at the office where received.

THE SCIENTIFIC PUBLISHING COMPANY.

WILLIAM VENTZ, SECRETARY.

27 Park Place,

NEW YORK CITY

P. O. Box 4404.

CONTENTS FOR THIS WEEK.

The Formation of Concretions.....	97	EDITORIALS:	
Scotch Blast Furnaces.....	97	The American Iron and Steel Association.....	104
New Steamboat Bill.....	97	The Block System of Moving Trains.....	104
Estimating Brick in Furnace Lining.....	97	CORRESPONDENCE:	
Clayton Valley, Nevada.....	98	Blast Furnace Explosions.....	105
Product of the Lake Superior Mines and Furnaces.....	99	Pittsburgh Trade, 1873.....	106
Engineering and Mechanical Notes.....	100	Large Product of Bessemer Steel.....	106
American Machinery in Europe.....	100	Casualty.....	106
THE COAL TRADE.....	101	MINING SUMMARY:	
IRON MARKET REVIEW.....	103	Nevada.....	106
San Francisco Stock Market.....	103	California.....	107
		American Institute of Mining Engineers.....	108
		Advertisements.....	108

THE new steamboat bill contains a proviso that when there is no other public means of conveyance, nitro-glycerine, or any "other explosive burning fluids," may be carried by steamboats under regulations of the Treasury department. This enactment is a very important one to manufacturers of modern explosive materials. The severe accidents which resulted from the explosion of nitro-glycerine a few years ago shut its makers so completely out from the ordinary means of transportation, that all sorts of devices, open and secret, were resorted to in the effort to sell their goods. We believe the nitro-glycerine makers have been in the habit of sending their wares about the country in light spring wagons, and the next jaunty-looking vehicle any one of our readers meets on the road, may contain enough of this material to blow him and half of the neighborhood to atoms. This mode of transportation is of course expensive, but we think it is the safest. At all events no wagon has blown up so far, and if the accident were to occur, the results could not often be as serious as a similar mishap on a public vehicle. The provision in the new steamboat bill, to which we allude, deserves careful consideration. We believe foreign governments do not permit the public transportation of such materials, and we are quite certain that nothing—not even high prices—could be more disastrous to the general use of these strong explosives than accidents occurring from their transportation. Better the deadly buggy than the explosive baggage car.

As will be seen by the Bulletin, in another column, the American Institute of Mining Engineers will hold its next meeting in this city, commencing on Tuesday evening, Feb. 24, at 8 o'clock, in the rooms of the Geographical Society, Cooper Union Building. Several interesting and important papers are already announced; and we do not doubt that the meeting will be professionally as successful as its predecessors. In fact, the period for doubt in this respect has gone by. It is now merely amusing to recall with what anxiety, on earlier occasions, the active managers and local committees have looked forward to successive meetings, fearing, as each approached, lest the tide of success might prove to have passed its flood, and begun to ebb. Gradually the conviction has come to all that this is not a tide, but a stream; and that it cannot cease to flow, because it is fed by perpetual rains at its sources. In other words, the active mining and metallurgical engineers of the country have combined by gravitation, as do the tributaries of a river; and the river will run as long as their lives of professional achievement and endeavor continue. We believe it is not proposed to give much time, at this unfavorable season, to excursions. One day (Thursday) will be spent in visiting the mines and furnaces at Ringwood and Durham—names, the

simple mention of which calls to mind a host of associations connected with the vital history of the American iron manufacture. We will not superfluously urge the members and associates of the Institute to attend this meeting, but rather condole in advance with those who may find themselves unable to come.

Mr. SUMNER has introduced the following bill (No. 119) into the Senate:

Be it Enacted, etc. That no person shall counterfeit or make a *fac-simile* of any metal casting, by using such casting as a pattern in molding, unless by the written consent of the owner or producer of the original pattern from which the casting was made; and any person who shall counterfeit or make a *fac-simile* of any metal casting, either in whole or in part, by the means aforesaid, without the consent of the owner, shall be liable to such producer or owner of the original pattern in the amount of the ordinary wholesale profits upon the articles so produced, recoverable, with costs, by bill in equity, in any circuit court of the United States, and the court may restrain by injunction, and may order that all counterfeit metal patterns, and the metal products therefrom, shall be delivered to the complainant or be destroyed by the marshal, and may pass such further orders and decrees as may be meet in the premises.

This has been read twice, ordered to be printed, and referred to the Committee on patents. We hope it will rest there. The patent laws already provide in the most comprehensive manner for the protection of original work, and if Congress goes further still and attempts to establish an espionage over the details of every man's shop, the result can only be injurious to manufacturers of all kinds of castings. No doubt injustice is now done enterprising men by imitators who make use of designs which have cost a great deal of money to get up. But if there is no invention in these designs we do not see how the Government can interfere to prevent it; and we decidedly think that it ought not to interfere. The effect of espionage such as this bill would call forth, is to be seen in the scandals which the operations of revenue informers have lately produced in some of the best known business houses in this country. There is a loud outcry against the continuation of laws which permit cases of such undoubted injustice to be increased in number, and we doubt if this bill would receive the support of the manufacturing community. We have pointed to the notorious "revenue cases" as an example of what would be the probable result of passing this law, and we will add that the firms which have suffered most seriously by the operations of informers are not those small and weak concerns which might be supposed to be the surest victims of the law, but they are among the most prominent and powerful houses in the country. The bill under consideration is probably the work of some "leading" manufacturers, who think to protect themselves against piracy. Unless this law forms an exception to others of its kind, it is precisely the leading men among manufacturers who would probably feel its rigors.

The American Iron and Steel Association.

THE Iron Masters' meeting, which took place in Philadelphia on the 5th inst., was attended by a large number of the principal representatives of our great iron industries in every part of the country. So favorable an opportunity for the exchange of experience and for consultation on matters of practical importance very rarely occurs. Yet, on this occasion, this utilitarian view of the meeting was not a part of the official programme, and was, in fact, entirely ignored.

The bar iron, pig iron, plate iron and rail interests are now represented by the central society, the American Iron and Steel Association. To effect this very desirable union was certainly the most important business of the meeting, and with the exception of the adoption of a memorial to Congress, which is likely to do more harm than good, there was really no other business transacted. We are among those who believe the principal object of the association of our iron men should be, as it is stated in their rules, "To provide for the interchange of information and experience, both scientific and technical;" but, from the action taken at this and former meetings, one might suppose the sole object of the association to be the promotion of lobbying schemes at Washington, and there would appear to remain neither means nor time to devote to the advancement of that knowledge of the business which alone can lead to permanent success and enable American ironmasters to compete advantageously in the markets of the world.

When it was urged upon the officers of the Iron and Steel Association to take advantage of the accumulation of knowledge—if we may so express ourselves—at the Vienna Exposition, by sending a special commissioner to examine and report on the condition of the iron and steel industries in those countries which now compete in our home markets, and which must always be our competitors in the outside markets of the world, what was the answer? Simply, in effect, that the association, having to spend some \$20,000 or \$25,000 in Washington, could not afford to invest even two thousand dollars in obtaining information of a "merely technical," that is to say, merely essential, character. And this appears to have been the policy of our American Iron and Steel Association from its inception. Are we then wrong in saying, that so far as the interests of our iron and steel industries are involved in the diffusion of that knowledge which will enable us to make iron and steel cheaper and better, our American association has contributed absolutely nothing? It is to be hoped that in its enlarged sphere it will not allow this reproach to continue.

Last week we gave the principal statistical items contained in the Secretary's report. We do not propose to criticise it further than to say that we cannot see in it cause for the admiration expressed by some members of the press. It consists of a very sensible introduction, demonstrating the necessity of a single association for the collection of statistics and the protection of trade interests, and urging the point we have presented above, namely, the duty of the association

to pay attention to the metallurgy of iron and steel; a discussion of the currency, the tariff and British competition, in terms that are growing perhaps just a trifle familiar to weary ears; and the aforesaid statistics, partly from original returns, partly from newspaper clippings, and very good, so far as they go. Mr. SWANK has returns from 385 blast-furnaces, and says there are in all 650; but another authority gives the number at 730.

We can easily understand how it is that iron manufacturers favor high protective tariffs, just as importers and consumers advocate free trade; it is money in their pockets. But in this age of money-making, of "rings" and appropriations, we cannot refrain from admiring and commending the disinterested patriotism that asks for an increase of 11 per cent. in the duties on imported iron, "not as a protective measure, but for the benefit of the national treasury." It is quite refreshing to find our iron men so solicitous for the public good, and so candid in their disavowal of any need of assistance themselves. But could they not benefit the country more by taking such measures as would effect a reduction of 5 or 10 per cent. in the cost of manufacturing iron, than by spending the money of the association in constant agitation of the tariff question at Washington?

Mr. E. C. PECHIN of Dunbar made some very sensible and appropriate, albeit unpopular remarks, at the meeting. According to him, what we want in the iron trade is stability more than high prices—stability, and freedom from those violent fluctuations, which are so injurious in every manufacturing business. With more than 700 furnaces, this country has now a capacity for production exceeding our entire consumption of iron; and it is consequently home, rather than foreign, competition we have most to fear and to be individually prepared for. We must look abroad for a market to take our surplus production, if we would develop still further this great industry; and abroad we must necessarily come in direct competition, with no protective tariff to help us, with the manufactures of other countries.

Many of our furnaces are wastefully managed, and it is only by exercising strict economy in every branch of the iron manufacture, an economy guided by a full scientific and practical knowledge of the business, that we shall be enabled to reduce the cost of production and thereby extend the field of our markets.

Though Mr. PECHIN'S views were certainly shared by no small number of the gentlemen present, there was not another who had the moral courage to support them. It is to be hoped, however, that very few share the opinion of the gentleman from Pittsburgh, who said that Mr. PECHIN'S denunciation of the wastefulness and ignorance so apparent in some of our ironworks, should be considered "an insult to every ironmaster present." On the contrary, we believe the gentleman from Dunbar deserves the thanks of every intelligent ironmaster for his fearless protest against that ignorance which alone is a disgrace, and for his advocacy of that sound intelligent progress which obtains in many of our great ironworks and is the pride and credit of that industry.

The fact is, we have here, as is the case in every other country, many furnaces, badly located, ill constructed, and worse managed, where the cost of producing iron is consequently far in excess of what it is in our best works; and a great part of the periodical agitation for additional protection is made up by, or in the interest of these wasteful works.

It is one of the incidental embarrassments of all kinds of trades unions, that they are frequently expected to set themselves against the operation of national laws, and to maintain artificially the prosperity of their weakest and least deserving members. The American Iron and Steel Association, in demanding for the sake of works that ought to fail, a protection which is not required by those which wisdom, prudence and skill have made worthy of success, is doing just what workmen do, who demand high wages, and no distinctions, for good and bad, industrious and lazy, thrifty and shiftless, intelligent and stupid workmen alike. The attempt will in both cases come to grief. As Mr. PECHIN says, home competition, driving us to foreign markets, will soon reverse the commercial conditions of the problem.

The Block System of Moving Trains.

In an address lately delivered before the British Institution of Civil Engineers, by Mr. HARRISON, the President, some of the points respecting modern railroad construction and management were handled with great acuteness. In regard to the "block system" of running trains, Mr. HARRISON points out that while this much-praised mode eliminates a great many possible causes of accident, it increases the dependence of trains upon the accuracy of the road servants. That is to say, the element of human liability to error, which is precisely that one which man has no control over, now assumes greater importance than ever before. Accidents that are due to faulty material, defective workmanship, or even ignorance of physical and other laws, can be gradually but steadily made less and less possible, by improvement in knowledge and skill. But occurrences are constantly proving that the best trained servants are not free from mistakes, and that the most cautious natures sometimes experience a lapse of watchfulness. Mr. HARRISON says: "It is an undoubted fact that accidents often occur in the hands of the most experienced men in a moment of forgetfulness. Thus an accident happened under the block system owing to the momentary forgetfulness of a signalman, who had been selected to instruct the others in their duties. Some years ago the officer in charge of the chaldron wagon building, on the North Eastern Railway, pointed out that the tops of the wagons came so close together that any one standing on the soles might be jammed, and he recommended that the soles should be lengthened. The order was given for the alteration to be made; but within a few weeks the official referred to was killed in the very

manner he had suggested, though no man living knew the danger better than he did." These facts might be supplemented by many others to prove that accidents are not due to the habitual carelessness of railroad servants. In fact we doubt if any railroad can be found in the world which employs *habitually* careless men, either knowingly or ignorantly. As Mr. HARRISON justly remarks, it is not the *wilful* negligence of careless men, but momentary forgetfulness, often occurring to the best men, that is the serious source of accidents.

We have brought this subject forward as a continuation of our remarks on the subject of the "Law of Accidents," made in connection with the Harlem boiler explosion a few months ago. When an accident occurs the daily papers raise a demand for the prosecution of the company and all concerned in the affair, and if the coroner's jury brings in a verdict of wilful negligence, it receives the plaudits of thoughtless editors from one end of the country to the other. In this system there is some security. The terrors of the law are a power which is not to be neglected in the struggle against accidents. But the law cannot accomplish a tithe of what railway men can, and do, perform of their own motion, in the way of prevention. It is for this reason that such critical observations as those of Mr. HARRISON have value. The introduction of the block system, together with the automatic brake, must be looked upon as the great movement of the day to secure safety on railroads. Under these circumstances the remarks quoted below deserve to be carefully considered:

"It might be considered as settled that the block system would as soon as it was possible to complete the necessary works, be introduced throughout the whole of the railways in the United Kingdom: but its introduction at once increased that element of danger—"human fallibility"—to a very large extent. In the case of the North-Eastern system it was calculated that, on the completion of the block system, the number of signalmen would be increased from five hundred to two thousand. Observation and inquiry had clearly demonstrated that the introduction of the block system, and of additional signals, caused the enginemen and other railway servants not to keep the same lookout, or to use the same care as on a line apparently less protected. This was only human nature; but he did not intend to argue from this against the introduction of the block system. When, however, it was put forward as a perfect security to railway travelling, he wished to point out that it introduced another important element of danger, generally much underrated, and that railway officials might sometimes hesitate to recommend the adoption of the block system from this circumstance."

MESSRS. JOHN WILEY & SON, publishers of scientific books, have issued a catalogue of works in every branch of scientific inquiry, and technical industry. It contains more than 100 pages, and forms a very useful work of current bibliographical reference. This firm now have in press a work by Prof. TROWBRIDGE, of the Sheffield Scientific School; "Treatise on the Generation and Utilization of Heat through the medium of Steam and Steam Boilers," designed as a text-book and for practical use, and fully illustrated; "An Iron Trade Manual to the Leading Iron Industries of the United States, with a description of the Blast Furnaces, Rolling Mills, Bessemer Steel Works, Crucible Steel Works, Car Wheel and Car Works, Locomotive Works, Steam Engine and Machine Works, Iron Bridge Works, Stove Foundries, etc.," by Thos. DUNLAP, late Secretary of the Pig Iron Association; and other works of a scientific character.

CORRESPONDENCE.

Blast Furnace Explosions.

MR. EDITOR:—Explosions from gas at blast furnaces have become so common as to excite the constant apprehensions of furnacemen, and well they may, for the destruction of property is generally serious, and there is frequently loss of life. The high temperature in the hearth of the large-sized modern furnaces, the large quantity of melting stock contained in them, and the greatly increased height of stacks, are the reasons for the increased liability to gas explosions, and the large hot air pipes from the hot-blast to the tuyeres—15 to 24 inches in diameter—lend additional opportunity for the gas to find its way back from the furnace to the "air receiver," or the engine-room, where the explosion generally occurs, although in some cases it has occurred in the hot-blast. Every furnaceman knows what the cause of these explosions is, *i. e.* water in the furnace hearth, and they all should know how to guard against such disasters. For the benefit of any one who may not know, I will give three plain rules, proper attention to which will, in ninety-nine cases out of every hundred, prevent all danger, where water gets into the hearth.

First.—Be careful to have trusty keepers who can tell when water is getting into the furnace (which is an easy matter to a good keeper), and have it stopped immediately.

Second.—Never fail to have a proper air-valve which is easily and quickly turned, in the main hot air pipe, close to where the pipes branch off, to carry the air around to the tuyeres, and always be particular to close this valve the instant the blast ceases; this prevents the return of gas back through the blast pipes; or, as some are arranged with a valve at each tuyere, the one main valve is all that is necessary for the purpose, and is much more convenient for shutting off quickly. Have the "eye holes," through which the tuyeres are "snuffed," opened as soon as possible after the blast is taken off; the proper and safest way is to open them before the blast ceases, then shut the air-valve, and any gas confined in the hearth has free vent through the "eye holes."

Third.—Where a closed top is in use, always see to it that the tunnel-head is

opened when the blast is taken off, and so remains till after the blast has been turned on again. To insure safety in this regard a small bell should be hung at the top of the stack, with a wire running down to the front arch, that the keeper may signal the fillers to open the top, at the same time that the engineer is signalled to stop the blast, or when the blast is turned off. In case of an open top furnace, of course, this third precaution is unnecessary.

What I have given are simple rules, easily followed, and will add no additional expense, except it may be that of a valve. There are, I know, a great many furnaces unprovided with any means of closing the hot air pipe, and their owners will perhaps not see the necessity of such an arrangement until they learn by experience. I might say a great deal more on this subject, but I fear I have already taken up too large a space in your journal, and will here drop the subject, hoping that what has been said may awaken some of our careless furnace managers, and that blast furnace explosions, instead of growing more common, may, through proper care, cease to be heard of. For I venture to say that almost—if not every—destructive explosion at a furnace may be traced to carelessness, want of knowledge, or lack of proper arrangements.

MONTICELLO, Pa.

WM. W. ACHESON.

Pittsburgh Trade, 1873.

PITTSBURGH has eleven furnaces, with a total capacity of 3,200 tons per week. The ore receipts in 1873 were as follows:

	Tons.		Tons.
Lake Superior.....	202,840	Native ores.....	1,492
Lake Champlain.....	3,440		
Iron Mountain, by river.....	88,489	Total.....	320,842
Iron Mountain, by rail.....	24,580		

Pig Iron receipts:

	Tons.		Tons.
By rail.....	280,332	Blooms and scrap.....	12,209
By river.....	17,801		
Total.....			310,342

Grand total (1873).....Tons 631,184
As against (1871).....Tons 367,207

Coal and coke in 1873 show a falling off as compared with the previous year:
1872—Coal, 115,065,146 bush.—4,109,470 tons.
1873—Coal, 106,546,339 bush.—3,805,226 tons.

56,173,238 bushels of the receipts of coal during 1873 were by water, and mostly for export to the South and West.

On account of the stagnation in the iron business, the panic, and the strike among the miners, the coke trade experienced a heavy falling off during 1873:
In 1872, coke received 43,927,965 bush.—1,098,199 tons of 2000 lb.
In 1873, coke received 34,230,500 bush.— 855,762 tons.

Pittsburgh Commercial..

Large Product of Bessemer Steel.

THE superintendent of the steel works of the Cambria Iron Company at Johnstown, Mr. JOHN E. FRY, makes the following statement of the works for the week ending January 17, 1874:

Number of blows.....	189
Number of tons of ingots.....	955 ⁹⁸⁰ / ₂₄₄
Starting time for cupola, Jan. 12th, 5.30 A. M.	
Last blow made, Jan. 17th, 2.20 P. M.	
Consecutive hours run.....	128 5-6
Average heats per hour.....	1 ⁴⁷⁷ / _{100.0}
Monday, 12th inst., 24 hours.....	34 blows.
Tuesday, 24 hours.....	37 blows.
Wednesday, 24 hours.....	31 blows.
Thursday, 24 hours.....	33 blows.
Friday, 24 hours.....	46 blows.
Saturday, 5 1/2 hours.....	8 blows.
Delays for week, 4 hours and 5 minutes.	
Greatest production in a given time:	
Tuesday, 7 1/2 hours.....	16 blows.
Friday, 8 hours.....	17 blows.
Friday, 24 hours.....	46 blows.

BLOOMING MILL.

Number of blows heated and rolled.....	189
Number of tons of ingots.....	955 ⁹⁸⁰ / ₂₄₄
First blow charged, Jan. 12th, 8 A. M.	
Last blow rolled Jan. 17th, 4 P. M.	
Consecutive hours run.....	128
Average heats per hour.....	1 ⁴⁷⁶ / _{100.0}
Greatest number of heats in 24 hours.....	46
Greatest number of heats in 8 hours.....	16
Fastest work, 32 ingots in 82 minutes.	
Delays during week, three and four-sixths hours.	

The work in both departments was performed without previous preparation, and with the regular hands, no additional ones being employed.

This product was so remarkable and so creditable to Mr. FRY and his assistants that the general manager of the Company, Mr. MORRELL, deemed it proper to issue a special order of commendation and thanks during the following week. We quote from this order as follows:

“The report of JOHN E. FRY, superintendent of the steel works, for the week ending on the 17th inst., shows that the product of steel blooms during that period exceeds in quantity, while equaling in quality, the best results published by other works, in this country or abroad, in which machinery of the same capacity is employed; and is a direct evidence of ability of management, and superior intelligence, zeal, and efficiency on the part of the workmen.

“The Company is gratified that the capacity of the works, developed by the

harmonious co-operation of all the skill and labor which they employ, has been so signally demonstrated, and the thanks of the Company are hereby extended to the superintendent, foremen, and the employees generally.

“It should be noted that the large product was not the result of any special preparation; and that it has not caused any exhaustion of forces, or damage to machinery, is shown by the large and good work of the current week.”—*Bull. I. & S. Inst.*

Casualty.

An accident occurred at the steel works of the Cambria Iron Company, Johnstown, Penn., February 11, by which three persons were fatally injured, and thirteen others more or less seriously burned. A large ladle, containing five tons of molten steel, was overturned and showered the hot liquid over sixteen men. FRANK HUGHES, JAMES SCHULER, and JOHN WHITMAN were so badly burned that there is no possibility of their recovery. JACOB SWARNER had an arm broken and was badly burned about the body. Mr. WILLOUR, the foreman, was among those injured. Some of the men had the clothing all burned from their bodies, even to their shoes. The company will look after the comfort of the men until they recover.

THE *London Mining Journal* of January 17th has the following from a correspondent, in regard to the Emma mine: “Nothing is known by the directors of the great strike, or discovery, reported in last week’s *Journal*. A small body of very rich ore, about 18 tons, averaging about 600 ozs. of silver to the ton, had been left in the winze against the partition limestone, and when it was extracted and carted away a report arose of the striking a new vein. No such good luck, alas! for the *piping* which ATTWOOD was following down the winze has entirely disappeared at present, and it was only worth £10 a ton. Latterly the mine has been earning about £700 a month, and costing about five times as much—a very good reason for the manager’s resignation, with nothing in sight, ore exhausted, and funds as well.

MINING SUMMARY.

Nevada.

RAYMOND AND ELY MINING COMPANY.

EXTRACTS from the Annual Report, read at the meeting held January 27th, at which the old Board of Trustees were re-elected. The report of the President, Alpheus Bull, says:

A short time after the last annual meeting of the stockholders of the Raymond & Ely Mining Company, a diminution became apparent in the quality and quantity of the ore, and, of consequence, in the production of bullion. This condition of affairs has extended throughout the year. We have been for some time past, and are still, engaged in developing and exploring our mines, with every reasonable hope of soon discovering new deposits, corresponding in character with the rich ores extracted in former years.

During the year 1872 dividends were paid with great regularity. Anxious not to depart, if possible, from long custom, the Trustees paid a dividend in January last, relying for much of the amount on the production of bullion during that month. To this extent they anticipated the profits of the mine. Had it not been for unusual circumstances, against which no human foresight could provide, they would not have been disappointed. He then goes on to state that the epizootic unfitted all the horses in eastern Nevada for work, and the cost of transporting ore was very much increased. When hauling by ox-teams, it was found impossible to keep more than one mill running regularly. Had the production of ores from the mines continued as large as the developments apparently warranted one year ago, the return in the shape of freights earned by the railroad would have been greatly augmented. The railroad is bound to transport our ores for one-half the amount charged by teams. When the mine becomes more productive the benefits arising from the transportation by the railroad will be more than realized, besides relieving the company from loss and embarrassment growing out of the stoppage of their mills, in consequence of the bad condition of the roads. The receipts of bullion during the past year have decreased considerably, when compared with the product of previous years, while our expenditures have been unavoidably increased. A material portion of this increased expense has been incurred in the effort to protect the company’s property from parties who were struggling to dispossess the company of a large part of their valuable mining ground. Besides the anxiety as to the result of this continuous litigation, it has necessarily greatly embarrassed the management of the company’s affairs. When the suit against us first assumed a formidable aspect a proposition to compromise was made by our opponents, but it was rejected as exorbitant. The case went to trial, and the verdict of the jury was adverse to this company. Subsequently a settlement was effected upon far more reasonable terms, amounting to little more than one-half of the sum at first demanded. Involved in this suit was the title to 1,200 feet of the Magnet Mining Company’s property, adjoining us on the west. That company has agreed to pay one-third of the amount expended by this company in effecting a settlement. To secure this, that company has conveyed its 1,200 feet of mining ground to the Raymond & Ely Mining Company. This will explain the items of bills receivable held against the Magnet Mining Company.

In a recent trial before the court, the title to our mining property was fully sustained and clearly vindicated. From this time forward we have every reason to believe that no serious question can arise affecting the title to our mining property. We feel confident that our litigation is substantially at an end, and that henceforth we shall have peace. Heavy and complete hoisting works have been erected at the shaft, with ample power to explore the mine to a depth of 2,500 feet. Our mining operations during the year have been confined to the Panaca mine. Nothing has been done on the Burke mine and the Creole mine, belonging to the company.

SUPERINTENDENT’S REPORT.

The report of the superintendent, H. H. DAY, gives the following detailed statement of the work at the mine and mills during 1873:

Ore extracted.....	18,825 Tons.
Ore sent to mills.....	27,024 “
Ore reduced at Company’s mills.....	24,546 “
Ore “ “ Custom mills.....	3,052 “
Bullion produced from ore.....	\$1,959,023 53
Average assay value of ore worked at Company’s mills..	\$90 32
Average percentage obtained.....	82
Average assay value of ore worked at Custom mills per ton.....	\$57 68
Average percentage obtained.....	76
Tailings worked.....	9,901 Tons

Kanawha Items.

THE KANAWHA AND OHIO COAL COMPANY, of Coalburg, W. Va., are mining about 9,500 bushels, or 300 tons per day; some of their splint coal is now sent to the New York market. This company employ some 150 miners.

MORRIS and PHILLIPS, who, last fall, commenced mining near Field's Creek, and shipped about 200 tons, are again at work, but are stocking their coal.

LEWIS and Co, also near Field's Creek, are working about 70 men, and loading most of their coal in boats. They mine about 3,000 bushels, or, say 100 tons per day.

COOK and Co are opening a small vein near Blacksburg.

GORDON AND SEAL have 16 men at work.

AT CANNELTON the Company is mining to keep men employed, and is stocking coal.

AT HAWKNEST the Gawley Kanawha Company is grading roads and opening mines. It is said Professor ANSTEAD's plan of opening mines is by means of a shaft to let the coal down from the upper to the lower vein, from which a tram road, with a grade of over 200 feet per mile leads to the C. & O. R. R. We have heard it stated that the Professor proposes to keep the shaft full of coal, filling in at the top as it is drawn out at the bottom. We don't know the depth of the shaft, but it is quite considerable, and we doubt, if this be the plan, it will be found more satisfactory on paper than in practice. There are some other expectations of this company, which appear as of difficult realization in practice.

AT SEWELL about 1,000 bushels has been brought down, and preparation for coking it is being made. The seam is said to be $4\frac{1}{2}$ feet thick. The inclined plane 2,100 feet long.

AT QUINEMONT coal is being mined and sent to Staunton and other points on the C. & O. Railroad.

American Institute of Mining Engineers.**OFFICIAL BULLETIN.****Announcements to Members and Associates.**

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues are payable in advance at the annual (May) meeting. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

IV. The next meeting of the Institute will be held in New York City, beginning on Friday evening, Feb. 24, at the rooms of the Geographical Society, in the Cooper Union. The Council will meet on Friday afternoon, Feb. 24, at 2 o'clock, at the office of the ENGINEERING AND MINING JOURNAL, 27 Park Place.

THOMAS M. DROWN, Secretary, 1123 Girard street, Philadelphia, Pa.

Advertisements.**Mass. Institute of Technology.**

Entrance Examinations on June 1 and 2, and September 23 and 24. For New Catalogue and late entrance examination papers, apply to Prof. SAMUEL KNEELAND, Secretary, Boston, Mass.

"IRON" (WITH WHICH IS INCORPORATED the MECHANIC'S MAGAZINE, a Journal of Science, Metals, Patents and Manufactures, Engineering, Building, Railways, Telegraphy, Shipbuilding, Factory News, etc., etc.)

Subscription, 30 s. per annum, post paid. May be had of all News-vendors and from the offices 90 Cannon street, London, England.

WOOD ENGRAVING

EXECUTED AT THE OFFICE OF

The Engineering and Mining Journal
27 PARK PLACE, NEW YORK CITY.

"ENGINEERING."

"The leading Engineering Journal of the world," indispensable to every Civil, Mining, or Mechanical Engineer, can now be obtained post-paid at \$9 30 currency, by remitting Post Office order to New York Office "ENGINEERING," 52 Broadway.

MISCELLANEOUS.**THOMAS M. DROWN,**

**ANALYTICAL CHEMIST
AND
CONSULTING METALLURGIST,
1123 GIRARD STREET,
PHILADELPHIA.**

Analyses of Irons, Steels, Alloys, Ores, Coals, Smelting Products, etc.
Iron and Coal lands examined, surveyed and valued.

W. M. BOWRON, F. C. S.**J. F. ROBERTS, M. E.**

**BOWRON & ROBERTS,
Metallurgical Engineers,
BLAST FURNACE EXPERTS,**

Furnaces designed, erected and blown in. Charges apportioned. Titanic Ores treated.

Sole American Agents for Whitwell's Hot Blast Fire Brick Ovens.

426 Walnut street, Philadelphia, Pa.
feb14-1y

ISIDOR WALZ, Ph.D.

**ANALYTICAL AND CONSULTING CHEMIST,
No. 18 EXCHANGE PLACE
NEW YORK.**

**SUPERIOR RAIL MILL.—CAPACITY: 1,000
TONS PER WEEK.**

**Harbaugh, Mathias and Owens
Manufacturers of**

RAILROAD IRON,

Office, corner Fifth Avenue and Smithfield Street, Pittsburgh.

Our central location enables us to draw from both sides of the Allegheny Mountains Metals and Ores best adapted for making a No. 1 Rail, and together with our Improved Machinery, are a sufficient guarantee of our ability to produce Rails of a quality unsurpassed for durability and strength, by any foreign or domestic manufacture.

New Patterns, of any desirable weight, made to order on Short Notice.

We respectfully solicit orders for New Rails, or Re-rolling. June 25-1y

United Royal Smelting Works

OF THE

Kingdoms of Prussia and Saxony.

GENERAL AGENCY:

R. J. ROBERTSON, HAMBURG, GERMANY
REPRESENTATIVE FOR THE UNITED STATES:

H. ROBERTSON, 149 BROADWAY, NEW YORK

During a temporary absence of Mr. H. ROBERTSON, and until further notice, all communications should be addressed to

R. J. ROBERTSON,
Hamburg, Germany.

OLIVER'S POWDER.

This Powder recommends itself for its

SUPERIOR STRENGTH

and

FREEDOM FROM SMOKE

Direct orders to

PAUL A. OLIVER,

dec9-1y

WILKESBARRE, PENN.

COPPER ORES PURCHASED.

CHARLES M. WHEATLEY,
SCHUYLKILL COPPER WORKS,
PHENIXVILLE, PENN'A.

Jan. 31-6m

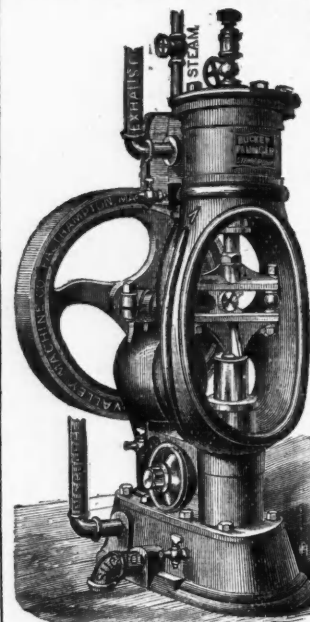
TO SULPHURIC ACID MANUFACTURERS.

FOR SALE:—Copper Pyrites containing 47 per cent. sulphur; either lump or granular, in any quantity required.
DYE & CURTISS,
Dec. 30-3mo 508 Sixth Avenue, New York.

FOR SALE.—A Chemist's Balance and Blow Pipe Apparatus, both of German manufacture.
Address GEORGE P. ATWILL,
feb14-1t Box 4, West Haven, Conn.

MISCELLANEOUS.

Improved, 1874.

**BUCKET-
PLUNCER***Steam Pump***ALWAYS****RELIABLE.****MADE**

BY THE

Valley Machine

COMPANY,

Easthampton,

Massachusetts.

**THE IRON-MASTERS'
LABORATORY.**

Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut Street, Philadelphia.

J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical ironmasters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of pure Iron in an ordinary Ore.....	\$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do.....	12 50
For each additional constituent of usual occurrence.....	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel.....	12 50
For each additional constituent of usual occurrence....	4 00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone.....	10 00
For each additional constituent.....	2
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal.....	12
For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.	
For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.	
Printed instructions for obtaining proper average samples for analysis furnished upon application.	

IRON AND COAL PROPERTIES

Examined and Reported upon, for Practical Purposes, by Experienced and Thoroughly Competent Mining Engineers and Experts.

Jan. 6-1f

JOLIET IRON AND STEEL COMPANY,

MANUFACTURERS OF

PIG METAL, RAILROAD IRON,

AND

BESSEMER STEEL RAILS.

Works at Joliet, Ill.

Office, 94 Washington street, Chicago.

A. B. MEEKER, Pres.

J. H. WRENN, Treas. and Sec.

THE FIRST VOLUME OF THE**TRANSACTIONS OF THE AMERICAN INSTITUTE OF MINING ENGINEERS,**

475 pp. octavo, with plates, containing numerous VALUABLE PROFESSIONAL PAPERS AND DISCUSSIONS, together with the Rules, List of Members, Proceedings, etc.,

IS FOR SALE

at the office of the Secretary, Price \$5.

THOS. M. DROWN, SECRETARY,
1123 Girard street, Philadelphia.