

# AMERICAN Journal of Mining,

Milling, Oil-Boring, Geology, Mineralogy, Metallurgy, etc.

VOLUME II. }  
NUMBER 12. }

NEW YORK, DECEMBER 15, 1866.

{ \$4 A YEAR IN ADVANCE.  
{ SINGLE COPIES TEN CENTS.

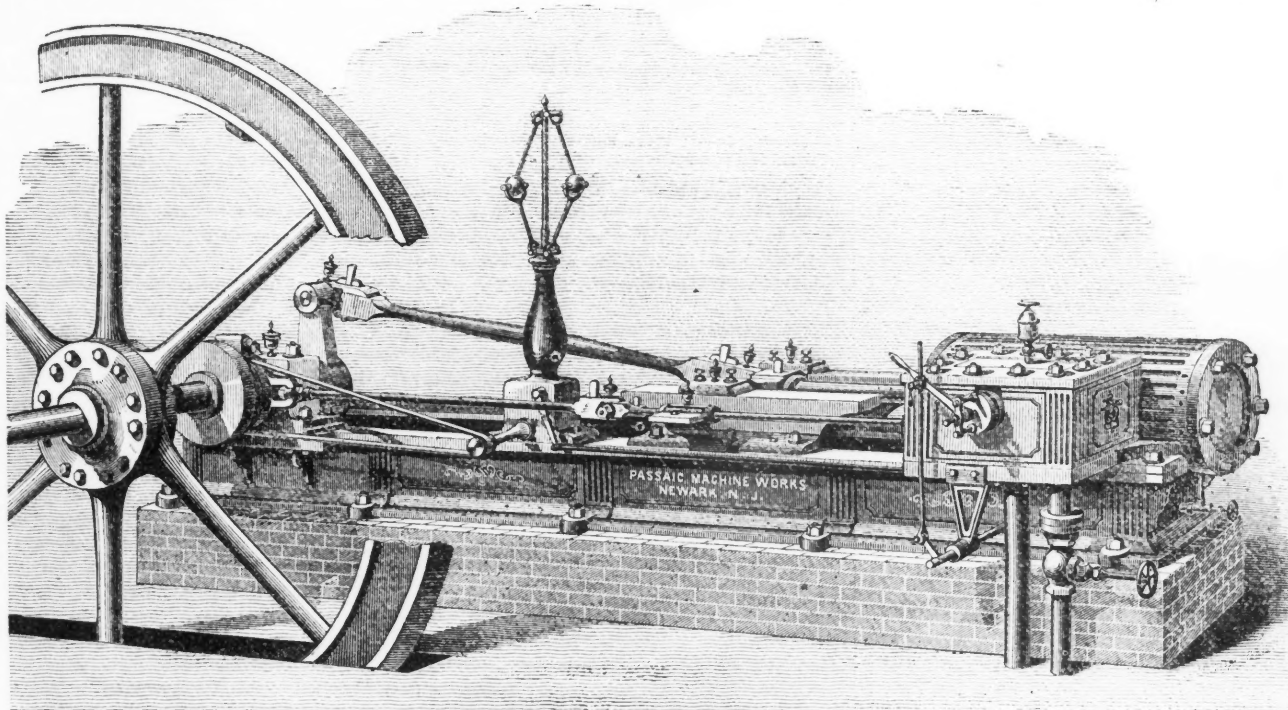
## HORIZONTAL STEAM ENGINE.

The Passaic machine works at Newark, N.J., of which Messrs. Watts, Campbell & Co. are proprietors, have been established since 1851—the firm at that time being Watts, Belcher & Co. The works cover about an acre of ground, and are fitted with the latest improved mechanical contrivances. About one hundred men are employed. The accompanying engraving represents one of their steam engines. The peculiar feature of which is the arrangement for working the steam expansively, which is performed by two

## Large Iron Works.

The largest iron works in Pittsburg are unquestionably the American Iron Works, owned by Messrs. Jones & Laughlin, of Pittsburg and Chicago, who have a capacity for turning out annually 29,000 tons of manufactured iron, and whose products in 1864 were 11,000 tons of bar iron and nails; consumed over 33,000 tons of coal, and gave employment to 13,000 men. Fort Pitt Foundry, famous for the manufacture of huge artillery for the defense of our forts, and which the rebels found so troublesome, when belch-

would urge you to consider whether it would not be possible to introduce a measure next session making the adoption of Ansell's Fire-Damp Indicator imperative. I feel certain that these explosions, which have been frequent lately, might be prevented. The machine, which has the advantage of being simple in construction and not liable to get out of order, indicates as low as 2 per cent. of gas, and would give immediate notice throughout the mine, and even at the surface, of the presence of fire-damp. The efficiency of the Indicator has been fully tested, and surely enforcing the adoption of means by which so



WATTS, CAMPBELL & CO.'S HORIZONTAL STEAM ENGINE.

slide-valves, moving on the top of the main slide, the point of cut-off being regulated by the governor. We can recommend the steam engines, boilers and steam pumps manufactured by this firm to the attention of those desiring such.

## The Best American Ores of Iron.

The best steel made in the country is wrought out from the "spathic" iron ore found in the Housatonic valley of Connecticut and Massachusetts; none other such ore is known in the United States; the iron ores of Lake Superior, Lake Champlain, and the Cornwall hills in the Lebanon valley of Pennsylvania, are "magnetic," while all the other iron ores of Pennsylvania are "hematite." Ores from other sections, particularly Lake Superior, are brought to Pittsburg in considerable quantities to mix with the native ores, and so produce different, and in some cases, better metals. Perhaps one-half the ores worked at Pittsburg are brought from other States, and one-fifth of those worked in the whole State.—*Pittsburgh Manufacturing Journal.*

ing fourth 420-pound shot from the turrets of our monitors, between July 1861 and 1865, cast guns for the Government amounting to the total and inconceivable weight of 50,735,455 pounds, while the total weight of metal melted for these guns equaled nearly 100,000,000 pounds. The whole number of guns cast by them has been 2,509, of different sizes, both army and navy, among which were 555 10-inch and 198 15-inch guns; also one 20-inch "Rodman" and one 20-inch navy gun. The firm are at present turning out about 13 tons of projectiles and one 20 inch Rodman gun per day, and also have two 20-inch navy guns under way.—*Pitts. Mining and Man. Journal.*

## Ansell's Fire-Damp Indicator.

With reference to this instrument (which is fully referred to in a lecture by the inventor delivered before the London Association of Foremen Engineers,) Lord Kinnaird has written the following letter to the Home Secretary: "I see there has been another fearful colliery explosion, with great loss of life. I

many valuable lives might be saved is a legitimate exercise of the powers of the Legislature."—*London Mining Journal.*

## Quicksilver.

Following are the receipts per month from the New Idra and the New Almaden combined, since January last:

Month	Flasks
January	4,424
February	3,684
March	4,557
April	2,536
May	2,877
June	3,415
July	3,830
August	4,779
September	3,491
Total	32,998

## Remarkable Discoveries in Minnesota.

A correspondent of the *Herald* writes from St. Anthony Minnesota Dec. 3rd, that a Mr. Reuben

Nesmith while recently digging in his cellar in that town discovered an iron door, beneath which was a spiral staircase. He and his brother-in-law, Mr. Chamberlain, descended 123 steps and found themselves in a narrow horizontal passage, dug in the white sand, which, as every one familiar with the geological formation of the banks of the upper Mississippi knows, underlies a stratum of limestone. Proceeding along this passage a distance of about seventy-five feet, they emerged into a spacious artificial cave, also excavated in this white sand. This cave was of an oblong form, and leading out of it were several smaller ante-chambers all of which gave signs of having been at some former day occupied as depositories of some kind. Iron and copper implements, of a rough kind of workmanship, were found scattered about, some of them evidently having been used for excavating purposes, others for cooking utensils, the marks of fire being observable on the latter. On entering one of the small ante-chambers a number of rude seats were found, and upon one side of the room an elevated platform, upon which stood a roughly hewn stone, something like the reading desk of an Episcopal church. On the wall behind this desk, on either side of a colossal human figure, in bas relief, very curious hieroglyphics were found traced in the white sand, and an ornamental tracery of peculiar design covered the other three sides of the chamber. In the next apartment a sort of stone sarcophagus was found, upon the top of which was laid an immense rock, firmly cemented to the burial case, and which required the united exertions of four men to remove. This being done, a human skeleton was found underneath, the bones of which crumbled to powder immediately upon exposure to the air. Several copper and iron rings were found in the sarcophagus, and also a curious silver ornament, octagonal in shape and carved in unintelligible characters, some of which corresponded with those on the wall of the apartment above referred to. A third chamber was much larger in extent than the others, and the ceiling was very much like an inverted funnel in shape, directly under the apex of which was a large cube-shaped stone, which was stained with marks of fire and some other dark substance, and a deposit of hardened ashes lay around it upon the ground. It was evidently used as a sacramental altar, and this theory seems to be confirmed by the fact that an aperture large enough to admit the body of a man opens from this apartment into a smaller one, the floor of which is below that of the other rooms, and which is covered with a limy powder apparently the ashes of bones; whether human or otherwise cannot be ascertained. The whole affair is a mystery; the relics found are not at all aboriginal in character, and may have been the work of people existing long before these prairies were the hunting grounds of the Indian.

#### There's Work Enough to Do.

The blackbird early leaves its nest  
To meet the smiling moon,  
And gathering fragments for its nest  
From upland, wood and lawn;  
The busy bee that swarms the way  
Mid sweets of varied hue,  
At every flower would seem to say—  
"There's work enough to do."

The cowslip and the spreading vine,  
The daisy in the grass,  
The snowdrop and the early blue,  
Treach'ring as we pass,  
The ant, within its cavern deep,  
Would bid us labor, too,  
And writes upon its tiny heap—  
"There's work enough to do."

To have a heart for those who weep,  
The selfish drunkard win;  
To rescue all the children, deep  
In ignorance and sin;  
To help the poor, the hungry feed,  
To give him coat and shoe,  
To see that all can write and read,  
"There's work enough to do."

The line is short—the world is wide,  
And much has to be done,  
This wondrous earth, and all its pride,  
Will vanish with the sun;  
The moments fly on lightning wings,  
And life's uncertain, too,  
We've none to waste on foolish things—  
"There's work enough to do."

The planets, at their Maker's will,  
Move onward to their cars,  
For nature's wheel is never still—  
Progressive as the stars!  
The leaves that flutter in the air,  
And summer breezes woo,  
One solemn truth to man declare—  
"There's work enough to do."

Who then can sleep when all around  
Is active, fresh and free?  
Shall man—creation's lord—be found  
Less busy than the bee?  
Our courts and alleys are the field,  
If men would search them through,  
The best the sweets of labor yield  
And "work enough to do."

## Mining Summary.

### Nevada.

**The Comstock.**—On our editorial pages will be found matter of interest relative to the great Sutro tunnel . . . . The Gold Hill News, Nov. 19, says:—At the old works of the Yellow Jacket company they are hoisting ore principally from above the upper level, or what is called surface ore. This ore is a species of black gravel, and is of the same character as that found between Gold Hill and Silver City, and is much like it in the character of pay, being principally gold. The old works of the Yellow Jacket, with two or three exceptions, are inferior to none on the Comstock . . . . There has been received to-day at Gold Hill, for melting and assay, 1,640 ounces of crude bullion by Harris, 2,357 ounces by Van Wyck & Co., and 14,107 ounces by Edwards & Wiegand, and there was shipped from Wells, Fargo & Co.'s Gold Hill office, this afternoon, 24 bars of bullion, weighing 1602 lbs., valued at \$52,313 54. . . . The San Francisco *Mercantile Gazette* of Nov. 17th says: The Mining Share Market continues to gather strength, and some leading stocks have been sold during the past week at greatly improved prices. The list of dividend paying mines is increasing and a general improvement is noticeable; still there are claims that have latterly been a burden to stockholders, while some have not paid dividends for many months past, but the majority of this class are now reaching a degree of productiveness that pays expenses and provides the means of future developments. With scarce an exception the Washoe claims now in the market are doing very well, and many are challenging public favor with new evidences of value. In addition to the mining company dividends announced in our last, we mention that of Crown Point, Hale & Norcross, and Imperial, making the total cash disbursements of this nature to stockholders for the month of October \$229,200. . . . Chollar-Potosi opened at \$185, receded to \$159, steadily advanced to \$202, buyer 20, and closed at \$225. We learn that favorable results have been obtained by this company in the first station drift of the new shaft. The cross-cut on this level is about 200 feet north of the turn-table, and the developments at a distance of 20 feet exhibit a deposit of fine ore about six feet in width. This is an entirely new body of ore, it appears, and by later information than the 11th inst., is said to be improving as work progresses. Average assays made from ores taken from all parts of the drift give a yield of \$107 and \$133 to the ton, while selected ores produced \$392 and \$900 to the ton. The 700-foot station in the new shaft, it is said, will soon be reached, which is 866 feet from the line on the Gould & Curry croppings. During the week ending the 11th inst. 553½ tons of ore were sent to custom mills. . . . Ophir was in more than usual demand the past week, selling at \$82 50, seller 30, dropping to \$71 and \$70, rallying to \$85, seller 30, and closing at \$190. Assessment of \$172 per foot delinquent on 19th. This company is at present vigorously at work stopping from the 7th level towards the Walsh shaft, and they are now about 60 feet east of that point. By this means they are endeavoring to reach the rich ore under the base metal discovered at that place in going down in the Walsh shaft, but which had to be abandoned at the time on account of the presence of a large body of water. . . . Crown Point was dealt in to a very limited extent during the past week, selling at a recession from last quotations—\$880 and \$80, then dropped to \$800, closing at \$940, ex-dividend. Considerable ore, it is said, is still being taken from above the 300-foot level. In going north from the main drift on the 400-foot level, the ore is said to have considerably improved. The middle incline was within about three feet, on the 10th inst., of the 400-foot level, and still in good ore. The mine produced 658 tons of ore during the week ending November 10th. This company paid a dividend of \$50 per foot on the 15th. . . . Savage ranged from \$1,450 to \$1,490, buyer 30, early in the week, then advanced to \$1,540, suddenly improved to \$1,710, and \$1,750, buyer 30, and closed yesterday at \$1,660. The yield of ore during the week ending November 10th amounted to 1,469 tons, valued at \$65,659, and deducting the expenses of extraction and reduction, leaves an estimated balance of \$36,735; the average yield is \$44 70 per ton. This amount of ore was taken from the following points of the mine: 6th station, 826 tons; 7th station, 66 tons; upper level 152 tons, and from the Curtis shaft 425 tons. The winze from the 6th to the 7th level, at a depth of 70 feet, continues in good ore, and the drift on the 7th to connect with it, it is said, also produces fine ore. From this fact, the reasonable deduction is made that a large body of ore extends through the entire 100 feet between the 6th and 7th levels. In the Curtis shaft, the north drift is vigorously pushed forward in order to reach the old works as soon as possible. It passes through a variable quality of ore. . . . Gould & Curry realized \$400 per foot during the week, and at the close at \$500. Nothing of importance concerning this company. We notice that Mr. David Bowie, formerly secretary at the company's reduction works in Virginia City, has assumed the secretaryship of the company in this city, made vacant by the resignation of Mr. J. M. Shotwell. . . . Yellow Jacket opened at \$690, then rapidly

improved to \$720 and \$725 50, then sold at an advance \$175—\$930—and closed at \$935, ex-dividend. We can gain no authentic information relative to the rapid appreciation of this stock. Since the first of this month no reports have reached the office in this city. It is rumored that rich developments have been made in the lower level from the south shaft. . . . Hale & Norcross remains in firm hands, and no sales have been made in the Board the past week. We quote the stock nominally at \$1,800 bid per foot. The ore delivered to the reduction mills, to the 11th inclusive, amounted to 1,230 tons, 65 per cent. of the assay value aggregating \$69,473. A dividend of \$100 per foot was paid on the 15th out of the earnings for October. . . . Imperial opened at \$109, gradually improved to \$120, then advanced to \$127, receded to \$120, and closed at \$120. This company paid a dividend of \$8 per share on the 15th inst. The first clean-up for November amounted to \$16,000 and upwards. The Imperial Empire shaft had on the 10th attained a depth of 675 feet. The winter supply of ore, it is said, has been largely augmented since our last report. . . . Confidence improved from \$55 to \$58 and \$60, and at the close \$60 is asked. We learn that the aggregate yield of this mine for the fiscal year ending October 31st was \$285,680 68. . . . Empire Mill sold at \$112 50, advanced to \$120, and \$130 was bid yesterday. Belcher jumped from \$62 50, seller 30, to \$110, closing at \$130, buyer 30—assessment of \$33 per share delinquent to-day. Overman sold to an extent within a range of \$17a12, closing at \$31a27. Bullion opened at \$19, then sold at \$13 50, and closed yesterday at \$17 50.

**Humboldt.**—The *Register*, Nov. 17th, says: The Manitowac company, dispatched by Wells, Fargo & Co., Friday, 1,900 ounces bullion. . . . Levy dispatched from Star, Wednesday, 1,200 ounces. . . . Arrangements are being made with the North British company (owning the Agamemnon ledge) on behalf of the Pioneer & Inskip company, of New York, to open and work the ledge. This is acknowledged one of the very best ledges in the county. It has long lain idle, on account of the apathy of those having the title. Under the energetic management of Mr. Fall we expect to see handsome bullion returns before spring. The rich quartz crops finely, and if at water level it holds good to anything like the surface promise, it is a fortune to all concerned. . . . Fall & Co. shipped, this week, 500 ounces of bullion from Winnemucca District. It contains a considerable percentage of gold, and is expected to assay at least \$2 the ounce. . . . G. W. Holt was down this week with bullion from his mill, situated near G'naca's Bridge. He tells us a marvellous discovery, apparently, has been made within the past few weeks some distance from Fairbanks' farm, in Paradise Valley. Judging by the amount and appearance of the bullion produced from a working of 2,400 lbs. of the rock from the ledge, it will pay upwards of \$100 the ton; and Mr. Holt says the ledge is about 20 feet wide, and has been traced three miles. The rich rock is abundant, and teams had started up to commence a regular winter's work of hauling. Holt says the one company now working can easily keep his mill busy all winter, and promises to do so. . . . The same paper of Nov. 10th says: At Oreana the furnaces were not in blast when we were there—were undergoing repairs; but were fired up Monday, and are turning out plenty of bullion. The new building, for the large and improved furnaces, is going up as rapidly as the carpenters can do the work. Short of carpenters, and none to be got in the county. Coarse bullion stands in high stacks all about the mill, and finer bullion in large quantities in adjacent boxes. The refining has not yet kept pace with the smelting, and no shipments fill next week. About New Year's Day, Oreana will be lively.

**Co tez.**—The Reese River *Reveille*, Nov. 16th, says of the Nevada Giant ledge of Cortez District: Mount Tenabo towers ten thousand feet above the sea, and fully a mile above the valley at its base. The great vein crops out for a distance of over five miles, crossing the mountain diagonally, going from its base on the southwest to past its summit on the northeast. So conspicuous and so mammoth is its proportions, that it can be distinctly seen and traced from a distance of thirty or forty miles, resembling a great wall or balustrade, to the towering dome of the mountain. The width of this vein varies from one hundred to eight hundred feet, and in it are found chimneys of ore showing above the surface thousands of tons, and of indisputable value. From these croppings several tons have been brought to this city from time to time, and found to work at the mills from \$150 to \$500 per ton; yet, with its countless millions of treasures, it lies almost comparatively untouched. The late Cortez Mining company own an extensive claim upon it, in which is one of the poorest of the chimneys of ore, yet vast in quantity. The company has a mill some seven or eight miles distant, and have lately been working this ore to great profit, mining very rudely and packing the ore to the mill upon mules. . . . Gov. Chellis had just arrived at Austin, from Cortez, with some 9,000 ounces of bullion from the mills of the Mt Tenabo Company.

**Lander Hill.**—The following exhibit of the production of the Savage mine from its first working in 1863 to November 14th of the present year, which has been compiled from the books of the office, will show the steady increase in the amount:

Yield of 1863.....	\$3,626 21
" 1864.....	29,603 75
" 1865.....	109,913 84
" 1866 to November 14th.....	165,114 27

Total yield.....\$308,263 07

The yield of bullion for the present year will exceed \$200,000, as there is a month and a half yet in which to produce less than \$35,000, and the mine is now yielding over 1,200 per day. But these figures do not nearly show the production of the mine. Its huge ore dump—the accumulation of over three years—contains, according to the estimates of experts, fully 4,000 tons of ore, which will yield easily \$50 per ton. That this estimate is greatly below its value is shown by the fact that during the quarter ending September 30th, 1866, upwards of 200 tons were taken from the dump, without assorting or picking, and yielded \$74.09 per ton, as shown by the books of the County Assessor. It would appear to be singular that ore of the value of \$200,000 should be allowed to lie idle in a dump; but when it is known that up to the present year the mills had charged from \$100 to \$65 per ton for reducing sulphuret ore, the necessity for assorting the ore and leaving the inferior ore for a more favorable period will be obvious. The development of the Savage mine may be expressed simply 350 feet of incline and 1,500 feet of levels, and a few minor excavations; its improvements consist in hoisting machinery and pump, buildings, track, cars, tools, etc. Work and improvements were accomplished out of the proceeds of the mine, in addition to the small sum of \$3,500 raised by assessment. The mine did more than this: the considerable sum of \$70,000 was expended in settling conflicting titles, purchasing stock, and in law-suits. While the mine has been worked from the outset on the most perfect system, and its business managed with rigid economy, it is believed that at the present time the large sum extracted from the mine would do all the work and furnish all the improvements, and leave a profit of not less than \$100,000. When there shall be a 20-stamp mill attached to the Savage mine, the dump pile and even \$40 ore will be worked with handsome profit. One or two facts are deserving of special mention. As they push down in the mine the vein improves; it is found to be more compact, and rich mineral occurs in larger bodies—indeed, it is more generally diffused. Of 1,180 tons reduced during this year up to the 14th instant, the average yield was \$140 per ton, and there is included in this amount over 200 tons from the dump, which has been already alluded to, and which yielded \$74.09 per ton.—*Reveille*

**Walker River.**—A correspondent of the *Rye County News* says: I have just returned from a tour of three weeks to the new gold mines between East and West Walker rivers, in Esmeralda county. I shall go back in a few days and stop through the winter. The mines of which I speak are wonderfully encouraging, being gold-bearing quartz lodes of good width and well defined. Enough has already been discovered to give great hopes of permanency and future success.

**Hot Creek.**—A correspondent of the *Reveille* writes: The prospects of this mining district are of a cheering character. Its ledges are known to be rich as well as large, but as they are principally owned by prospectors who are not as well provided with available coin as they could wish to be, very little work is being done on them for the present. The erection, however, of a light ten-stamp mill in the district by the Consolidated Silver Mining Company of New York, is giving an impetus to work as well as trade. Another writes to the *Gold Hill News*: Fourteen hundred pounds of bullion was shipped last week from Dr. Partz's furnace, in Hot Spring district, to San Francisco, via Stockton. It was run out in forty-eight hours. I am informed by reliable parties that the Doctor's principle is a success, and it is only a question of time, when he can obtain the proper material for his furnace to stand the excessive heat he has to use. He has imported a quantity of English Bath brick, at a cost of fifty cents each, but the soda he has to use for a flux destroys the bottom of the furnace. He says if he can only make his furnace stand one week he will be satisfied, as he can afford to build a new one each week, and can run but six hundred pounds of bullion per day, working the rock within ten percent of a fire assay.

**Twin River.**—On Saturday, says the *Reveille* of Nov. 19th, a handsome lot of bullion was brought into town from the mill of the Twin River Mining company. There were about ten thousand ounces. We believe the stream of silver will flow steadily from that source in the future.

**Egan Canon.**—A couple thousand ounces of crude bullion arrived in town to-day from the Hope company, at Egan Canon. The mills of that district have been idle for some time, while it has the reputation of possessing a number of excellent mines.

**Pennsylvania.**

From the *Pittsburgh Mining and Manufacturing Journal*, Dec. 6th, we take the following: The best bituminous coal found in the United States is what is familiarly known as the "Pittsburgh coal." This coal is preferred to any other by all manufacturers west of the Alleghenies. It is largely called for and exten-

sively used by the steamboats of the Ohio and Mississippi rivers and their tributaries, and for domestic purposes by all the cities and towns in the West and South bordering those streams. The seam from which this famous coal is obtained is characterized as the "Great Pittsburgh Seam," and extends from a point west of the Allegheny mountains to the southwest angle of the State, a distance of 270 miles. It is traced along the Allegheny and Monongahela valleys. It has also been traced through Pennsylvania into Virginia, and also into Ohio, and is from twelve to fourteen feet thick at the southwestern border, from six to eight feet at Pittsburgh, and about five feet still further westward, in Ohio. Of the extent, richness and accessibility of this great seam, the geologist Lyell expresses his astonishment, and states that to properly estimate the natural advantages of such a region, we must reflect how the three great navigable rivers, such as the Monongahela, Allegheny and Ohio intersect it, and lay open on their banks the level seams of coal. Of the capacity of this and other bituminous regions in this country, Trego says: "In the bituminous coal there appear to be no less than ten separate layers or beds of coal, of sufficient capacity for mining, and which vary in thickness from three to ten feet." R. C. Taylor, in his coal statistics, says, "It is possible that within the entire series, from the conglomerate upwards, ten such seams may exist." Toward the north and the northeastern side of the coal range, the seams range from three to four feet. Near Karthaus, eight coal seams have been traced, three only are workable, the largest being six feet. At Blossburg, and around the head of Tioga river, from three to six seams occur, but not more than two have been mined, and the coals are sent by railroad to New York State. There are commonly four coal seams existing within the formation in the northeastern extremity of the field, and it is but seldom that more than two workable beds occur in the same locality. At Pittsburgh, the main bed of workable coal is six feet, and increases in thickness as it proceeds up the river to Brownsville, where it is estimated by Lyell at ten feet. We have already spoken of the waste of coal at the mines in this vicinity, above and below the surface. We cannot help noticing it again upon the railways that lead to them. They are black with scattered coal from the mines to this city. And the waste does not stop here. Those who complain most of the "high price of coal," cast thousands of tons of it into the ash-barrels every year. That which appears to be nothing but ashes contains a great deal of fine coal, which can be burned by wetting the ashes, and laying them over the top of a glowing coal fire. Perhaps it will be thought foolish to talk about economy of coal while it is so abundant. But we can remember when talking of saving timber subjected a man to ridicule, in districts where firewood is now worth \$6 or \$8 a cord, and fencing stuff is still dearer. The Lehigh Valley railroad carries an immense coal tonnage, and its great system of roads among the coal mines, as well as its thorough connections, and its immense local coal and passenger business, make it one of the most important trunk lines in the State. In 1864 there were 631,878 tons of coal transported over the road; the rolling stock consisting of 51 locomotives, 142 freight, 10 passenger and 2,575 coal cars. The length of track, including sidings used exclusively as coal roads, is 123 miles. Some idea may be formed of the extent and importance of the coal trade in the Lehigh region from the fact that nearly 8,000 men and boys are employed in the mines, which produced last year 2,040,913 tons of coal. The amount actually employed in mining is about \$19,000,000, while the investments in coal lands, railroads and canals may be estimated at \$50,000,000. About two-thirds of all the iron produced in Pennsylvania is manufactured in the Lehigh valley, around Bethlehem, amounting in 1864 to 215,000 tons, and likely to reach a similar amount in 1866. And the consumption of coal for the purpose is about 1,500 tons a day. The stacks of furnaces are enormous—huge double cones—rising 50 to 75 feet high, and taking in the iron ore and the coal at the fiery gate on the top by the hundred tons, and pouring out the liquid metal at the bottom in Vesuvius streams. Johnstown lies close and thick in a narrow valley, holding 15,000 inhabitants, all deriving their prosperity from the operations of a single company, the Cambria Iron Company, who own everything and run everything. Nature has richly gifted the location; the hills are iron on top, coal beneath; limestone, clay, the material for fire-brick, and water-lime cement, all abound as well—everything at hand for building purposes, and for carrying on extensively the manufacture of iron. The iron ore holds about 50 per cent. of pure iron, and nets in working about 33 per cent. It holds lime enough to flux it, also. The company confines itself to manufacturing railway iron, turning out 1,200 tons of rails a week, or enough to lay 12 miles of track. This is about one-third of all the rails made in Pennsylvania. The company has a capital of \$1,650,000, which is to be increased to three millions, employs 3,200 men and boys, pays \$1 45 per day for its crudest man-labor, \$2 and \$3 to its miners, and \$3 and \$4 to its best iron-workers. At Natrona, twenty-two miles above Pittsburgh, one may see a varied, curious and prosperous industry. Here are salt wells and soda springs; coal and lime are also, of course, abundant and cheap, as through

nearly all Pennsylvania; and by importing from Greenland, where only it is found, 6,000 tons yearly of an article known as creolyte, all the materials are secured for producing various important chemical and other choice articles valuable in the arts and manufactures. Thus here are made, in large quantities, common salt, sal soda, concentrated lye, oil vitriol, muriatic acid, soda ash, copperas, and distilled oils. A single company, with a capital of a million and a quarter dollars, carries on all those manufactures, besides making the paper and iron boxes into which they are packed for the market. The business is very extensive and prosperous.

**California.**

**Sierra.**—From the *Downieville Advocate*, Nov. 3d, we take the following: Knowles & Co.'s placer claims, described in a previous issue, are still paying rich. The result of the last run, for one week, was \$3,000—six hands. A test crushing from the Mexican quartz mine yielded \$12 per ton. From three to four per cent. concentrated sulphurets, by assay show \$8,300 per ton, gold. The Sling Canon company recently struck a very rich vein of ore about twelve inches wide. The sulphurets with which the vein is heavily charged, assay from \$1,500 to \$1,800 per ton. It is currently reported that the Sling Canon property is about to change hands—purchasers, San Francisco parties. Explorations in depth on the Von Humboldt mine are decidedly favorable, showing rich ores with a well defined vein. The Montpelier company, from indications in their adit level, are daily in expectation of striking their vein. The Good Hope are quarrying rich rock. Vein about thirty inches wide and well defined. In the Independence mine the ores are improving as the workings extend in depth. Page & Co.'s mine at Sailor Ravine has been sold to Messrs. Clark & Hurst, of San Francisco, for \$12,000. The purchasers are opening the mine under the management of A. Lee, O'Neil, Johnson & Co. are getting rich ores on the southerly extension of Page & Co.'s ledge. Negotiations for purchase of the American Hill mine, by some gentlemen from San Francisco, are pending. We understand that Mons. Serrand has made contacts with the Sierra Buttes company, Independence company, and Keystone company, for their sulphurets. Monsieur S. proposes erecting chloridizing works at an early date, in close proximity to the above mills, for the purpose of working their ores, which have long been known to be of a very high grade, but never utilized, averaging about \$300 per ton.

**Placer.**—The *Auburn Herald*, Nov. 10th, says: Beard & McKay have just had some rock crushed from their claim at Pugh's mill, at Ophir, which has turned out very well. Out of 42 tons crushed, 40 ounces of free gold was taken out the battery on Thursday last, and the Araster was yet to clean. We were yesterday shown some quartz from the Saffrage company's claim that really looks fine. It looked well in free gold, and was rich in sulphurets. Their shaft is now down about fifty feet, and the company are still going down. This company has "great expectations."

**Alpine.**—The *Miner*, Nov. 10th, says: The Washington mill, at Davidson's, is only waiting the arrival of the balance of the machinery to get into action. During the week about twenty-five tons of black ore has been hauled from the Morning Star mine to the Washington mill. Two teams—four and six horse—are now constantly engaged hauling, and the ore vein is of such size that two men can take it out faster than it is taken away. The contractor running the Tarshish tunnel is still making good headway, and expects to see the end of his first work—300 feet—before the new year.

**Nevada.**—The *Grass Valley National*, Nov. 9th, says: All the machinery for the 5-stamp mill for the Jim ledge is now on the ground, and will be shortly put up. This company have taken some fine rock out of their mine, and the ledge continues to look remarkably well. The Diamond Ledge company started up their works on Saturday last. They are down on the ledge about seventy-five feet, and they find the ledge to be about two feet in width. All the rock that has been taken out of the ledge so far has averaged about \$25 to the ton. The Yuba tunnel company have their tunnel in about one thousand five hundred feet, and also a drift of two hundred feet. Their prospects are exceedingly flattering. From a handful of cement brought down from there the other day, some \$2 in coarse gold were taken. The American company, at Manzanita Hill, San Juan, have a claim with a front of about five hundred feet; their sluices are from three-fourths of a mile to a mile in length, at the end of which are three pans, which grind up the coarse gravel. Connected with the end of the sluices is a strainer which saves the said gravel. This company have lately put up an 8-stamp mill. The *Gazette*, Nov. 14th, says: We learn that gold in considerable quantities has been discovered in a conglomerate formation on the line of the railroad, at a point above Alta. While making a cut on the grade through the conglomerate, some of the rock that had been thrown out by blasts was pounded in a mortar, and on being washed down was found to contain free gold. This led to further prospecting, which has pretty well established the fact that the rock will pay for working by mill process.

**Sacramento.**—The *Folsom Telegraph* says: In the Fisher claim, and also in the Poindexter claim, they have a large face of the cement exposed, and from which they expect to realize richly. Each company is working about eight men. It will take years to work out these claims. While at Fisher's claims, he washed about a handful of cement on a shovel, and got about twenty-five cents worth of coarse, rusty gold.

**El Dorado.**—A telegram in the San Francisco *Alta*, sent from Placerville, Nov. 12th, contains the following too-good-to-be-true tale: The Woodside quartz mine, located at Georgetown, struck the richest quartz on Saturday last that was ever seen in California. It is estimated by competent judges that over \$50,000 were taken out on Saturday and Sunday. They are now blocking out nearly a pure solid mass of gold three feet in length. This is no lumping, as my informants have seen and handled the chunks, one alone weighing over one hundred pounds. The shaft is one hundred and ten feet deep where the gold was struck.

**Shasta.**—The *Courier*, Nov. 10th, says: The Potosi mill, four stamps, cleaned up a four days' run last week, with a result of \$567 76, in free gold. The sulphurates saved from the run will nearly equal in value the amount in free gold.

**Kern.**—The *Havilah Courier*, Nov. 10th, says: The Joe Walker mine has, within the past ten days, yielded to its fortunate owners twelve thousand dollars in gold. From the extent of this lode already developed, it is safe to estimate that it will yield at least one thousand dollars per day for years to come.

### Montana.

From the *Virginia City Post*, Nov. 17th, we take the following: From the best means of information at our command, the reports of prospectors and miners, and statements of ranchmen and members of the Legislature from nearly every section, we have deduced the most satisfactory conclusions regarding the future development of the mineral and agricultural wealth of Montana. It is conceded that this Territory, with the exception of California, has produced more gold than any other mining region in the United States, in the last three years. But the quartz mills that have been erected have yielded only a very limited amount, and we anticipate a large increase every year from this source. This vital branch of our industry is in its infancy, and most of the richest veins are unexplored, and no improvement has been made upon them since the discoverer excavated his "gopher hole" and set up his posts to define the extent of his claim. Companies have announced intentions to build mills, and we have good grounds for stating that more than twenty will be brought from the States within the next twelve months. During the inclement season, when it is hazardous for persons to defy the forms and temperature of winter, shafts will be sunk upon many lodes, and no labor is more essential to the prosperity of all concerned. Gulch mining will be continued with the most successful results. New districts, like those of Highland, Rochester and others, will reward the hands of toil and bestow millions upon worthy and faithful workmen. The old diggings in the neighborhood of Virginia, Helena, Diamond City, and other localities, which are too numerous to be mentioned at the present time, are not exhausted. When certain ditches have been constructed at these points we do not have any hesitation in declaring that thousands of miners will be employed, and those who imagined that all the golden treasure had been extracted, will be astonished at the result. After reviewing the facts that have been thus briefly sketched, we believe that if all the statistics could be collected it will be found that Montana will yield more gold and silver during the next year than any other Territory or State in the nation. . . . The St. Louis and Montana mining company are getting along nicely with their present appliances. More than ten tons of ore can be run into lead every day, and eight tons of lead can be cupelled at one time. In addition to the two hundred tons of ore which will be furnished by the Legal Tender lode, about three hundred tons of ore, considered to be equal in richness to the former, has been taken from the Stapleton and Henry Clay leads. Wood, water and charcoal are abundant, and tons of silver will be produced during the winter. The day before the Governor arrived, the fifty pound brick was cupelled, and one ton and a half of splendid lead were extracted while he was present. . . . At Jefferson City a smelting furnace will be constructed during the ensuing winter. . . . Need Gulch is situated eleven miles from Virginia City, and is three miles in a southerly direction from the fall-gate on the road to Great Salt Lake. The gulch is thirteen miles in length, and commences at the Summit, from which the world-renowned Alder received its deposits of the golden treasure, and a small ridge separates them. The gravel yields from five to fifteen cents per pan, and the depth to the bed-rock is only eight feet, but the distance is greater in the canyon district. A drain ditch is being constructed, which will facilitate the labor of the miners. All parties, who have examined this gulch, are satisfied that, when it has been thoroughly worked (and it will be next year), many thousands of dollars will be washed from its golden sands. . . . Mr. J. Moore, who has just returned from the Salmon river district, brings the following interesting information: Five hundred

miners are working in the diggings, which comprise several gulches—Napa, Ward's, Antelope and Alder. The dust is of the finest quality, and has assayed in Helena \$19 20 per ounce. The towns of Leesburg, Grantville and Eureka are thriving at present. . . . The Helena papers say: A few miners returned from their journey to the Wind river mountains on the 6th, and bring reports not calculated to induce emigration thither. The best ground that was prospected by these men was only moderately good. We all know what this expression signifies, and as long as even moderately good claims remain unworked, all about us within a circle of a few miles, the better portion of the miners will remain here. . . . As an instance of the peculiar fortune of miners, we may mention a case not generally known, we believe, to our citizens. On claim No. 13, in Grizzly district, a deep shaft was sunk last fall, reaching what was then supposed to be the bed rock. This shaft being left open during the winter, the ground at the bottom was frozen very hard, and has not thawed out yet. Still a party has been working it, and has gone through the supposed bed rock, and is taking out the frozen pay dirt, which, when thawed out, is washed, and yields, under these unfavorable circumstances, from \$7 to \$8 per day to the hand. How much would be the yield with a fair chance at working the claim, old miners can perhaps form some idea. . . . Cave gulch, situated about three miles from New York, about which there was a stampede on a small scale two weeks ago, proves to be all that it was represented to be at that time, a thing very unusual, according to our limited experience of these affairs. From different sources we hear substantially the same news regarding the mining ground on this gulch. The diggings are deep, and the dirt very rich, paying \$2 50 to the pan on the bed rock. Parties of three and four men are taking out from \$200 to \$300 per day. Of course the ground is all taken up, and as we hear of no sales or quotations, we presume those who own ground are content to keep it.

### Michigan.

The *Ontonagon Miner*, Nov. 24, says: At the Aztec old openings are showing remarkably well; one pair of miners took out seven hundred pounds of barrel work a few days since at a single shift. The eastern openings are also paying well. Estimated product for the current month, ten tons of mineral. . . . **LATER.**—There is a great discovery at the Aztec. In blasting into their hanging-wall they have found a very rich vein full of copper—no telling how big it will prove yet. . . . Reports of continued improvements at the Evergreen Bluff and of a continuance of uniform "keenly" appearance on the Ridge, have reached us this week, but we have no particulars. Among the loads of mineral brought down from the former lately, most of which was shipped on the Ste. Meteor, we noticed several good sized masses. . . . Another advantageous purchase has just been made by the Mass Mining Co., viz: two hundred and forty acres of wood and timber land on the north bluff. This tract is situated in the east half of Section 33, Town 51, Range 38, and was formerly known as the Northern Mine. It is also situated on the Pewabic formation, if there is such a one in this district. It contains at least one well defined vein or copper-bearing occurrence, from which we have taken small nuggets of copper in an "arley day." . . . The old openings of the Caledonia, on and over the west adit, are again showing better than a short time since. On the level east over the deep adit there is a mass showing in the back and another in the sole of the level, but not enough exposed to judge of the probable size. In the North Side Openings a winze sinking on the north vein and on the crossing or "fissure vein" is yielding good chunks of copper and rich stamp work. A winze connecting Nos. 1 and 2 levels on the Knowlton vein is also producing very well in small masses barrel and stamp stuff. Some sheets of four to five hundred pounds each were taken out this week. The east drift from No. 1 cross out on the Knowlton vein is now in over two hundred feet. Till within the past week it showed but little copper, but is looking better now, affording good stamp and barrel work in a strong vein. The last of the season's product, some eight tons of ingot copper, left here on the propeller City of Madison on the 21st inst. . . . The opinion entertained by many persons that the discovery of the Cabinet lode is calculated to injure the country by cheapening the price of copper and its production, is simply a conjecture. In most metals the demand has increased on the supply, especially since the middle of the present century, and there is evidence that it will be so even if each local district on the Lake were working two or three calumets. Should the production be cheapened so that many mines now wrought cannot continue operations, they must suspend and search for other and richer lodes to work. Fortunately for those who reside beyond the limits of the Torch Lake District, that favorite locality does not contain all the copper bearing conglomerates of the range. We have certainly one and may have, for aught any one knows, a half dozen or more of that class in this district. Some twenty-five of the sixty-five tons of mineral raised by the National mine the past month, were from a single point in our most productive belt. The chief distinction between these two

belts is that the Calumet is continuously productive as far as opened, while the National is only so at intervals. When miles of that belt have been exposed we shall doubtless hear of poor places in it also. Another difference is that there is no distinct vein on the Calumet belt, while here the principal mining—too much, perhaps—has been done on instead of in the belt. Again our belt is more purely a conglomerate, containing coarser pebbles than the Calumet, and yielding heavy masses of nearly pure copper. Our districts contains numerous other belts within the main mineral zone, some of which are known to be productive, while others, as far as known, are non-ferrous. Many of these present favorable points for examination, which when done may prove a source of profit equal to any vein now wrought in the country. . . . The Knickerbocker *Tins*, of Nov. 24, says: The St. Clair will overgo, we are told, for November fifteen tons. The water stamps are working most beautifully, the heavy rains of the past five or six weeks furnishing an ample supply of motive power. . . . It was reported in these columns a few weeks ago that the Copper Falls would certainly give us for the month of November one hundred and fifty tons of copper. Look out for a product, instead, of one hundred and eighty tons, and we shall not be surprised if it exceeds even these last figures. . . . The No. 2 shaft at the Essex mine (Eagle Harbor) is being pushed ahead as rapidly as the united force at the disposal of Captain Harris will allow. They have experienced more or less trouble with water in the shaft. The vein now showing in the shaft is longer and better than it has ever been before. It is carrying considerable copper. At the Agency Place the vein is not looking quite as well in the shaft, but what they have is charged more or less with fine copper. . . . The Resolute mine is developing well.

### Idaho.

The *Avalanche*, of Nov. 10th says: In the District Court there has been no case of any great public importance tried at this session, except the Silver Monarch and Dahlgren quartz ledge dispute. The Dahlgren party tried to prove that the Monarch was the same ledge. The jury decided in favor of the Silver Monarch party. . . . Of the Morning Star mill, it says: It is pretty well settled that this pioneer institution will resume business soon under the management of W. L. Burnham and D. H. Jackson. As we are informed, the Vulcan ledge, a north extension of the Silver Cord, prospects exceedingly well, and shows a width of four feet, and that there are already two hundred tons of good quartz ready to haul. Also, that parties have contracted to take out quartz during the winter for a stipulated price, and that Mr. Lonecs is getting everything in readiness for a winter's work in the way of transporting it to the mill. Should everything connect as anticipated, matters in Owyhee will maintain a pretty healthy showing—all things considered. . . . A correspondent writes, Nov. 31, from Queen river, Camp McDermitt: 19 teams here loaded with quartz machinery; 10 more will be here to-night. Have no time to get particulars. Just learn as we start that the teams are loaded for the Osmos Co. Jones is boss. . . . On the first of the month, in view of the reduction of dust, Capt. Musgrave determined to place his operations at the Silver Cord on a greenback basis, and hired some men for that currency, payable at its face, and sent them to the mine. The operatives were object to the system, and determined not to permit them to work sending a committee of their number to the Captain to inform him of the fact. He immediately repaired to the mine, and upon an explanation all parties became satisfied with the change, a mutual good understanding was arrived at, and all hands went to work as usual. The change contemplates a reduction of two dollars per week in board and an increase of one dollar a day in wages, all payable in currency instead of dust as heretofore. . . . The prosperity of Owyhee depends solely upon quartz mines; such mines are of no general value until opened up and the ore crushed; and to effect this, much capital is a pre-requisite. Therefore, anything that tends to discourage capitalists in making investments is detrimental to the public welfare. We cannot ask the merchant, mechanic, and specially the owner of "feet" with no capital to put them in a paying condition, what will be their next year's gains if the efforts of those trying to introduce capital shall fail? Where is the money to come from to buy the immense stocks of goods now being received? to pay the mechanic for the stock, etc., he has accumulated? to buy the ledges of men who have reached their bottom dollar in finding them? In short, to inaugurate that degree of general prosperity, which, with our mines and capital, awaits Owyhee? We earnestly ask the hard-working, toiler-miner, as well as the others named, to calmly consider whether self-interest will not lead them to frown upon every movement in law or fraudulent sales that will discourage capitalists in putting their surplus money into the valuable ledges in which Owyhee county abounds? We know, personally, a score of miners who would be glad to take small sums for their claims. They are harassing agents of capitalists to buy their "feet," while these same agents are harassed to keep what they have spent hundreds of thousands in getting and de.

Can any man be short-sighted as not to see why sales are so difficult to effect? It is the fear of some other claim being asserted to the property when large sums of money have been expended in purchasing and proving it. It is not enough to say, "well, if the claim is ill-founded the purchaser will hold it," for the expense of litigation and vexation are matters that the rich no more fancy than the poor.

### Arizona.

We have to acknowledge the receipt of Governor Richard C. McCormick's recently delivered Message to the Arizona Territorial Legislature. As is usual with all his productions, this one is thorough and able. As to the mines of Arizona, he says: "If there is less excitement over our mining interests there is more confidence in their excellence, and a strengthened belief that their development will surprise the world. Ten quartz mills will have been erected in this county alone before the close of the present year. Those already in operation afford a gratifying evidence of the value of the gold ores, and as the lodes are sunk upon they show permanence and size. The appearance of sulphurets and refractory elements at a certain depth may involve the necessity of more elaborate machinery, but no obstacles will, I think, be sufficient to baffle the enterprise of our miners, who, depending more upon their own energies and capital than upon help from abroad, are determined to know no such word as fail. The rare advantages of wood, water and climate, are more than sufficient to offset the costs of living and the heavy expense of transporting machinery here, and I believe, as I have often asserted, that there are few localities upon the Pacific coast where quartz mining may be so economically, agreeably, and profitably pursued. Those of the silver mines below the Gila, and on the Colorado, that are judiciously worked, with scarcely an exception, show great wealth and fully maintain the traditional reports of the metallic opulence of the country. The considerable capital now devoted to the development of the copper lodes on the Colorado and Williams Fork is but an earnest of that which this important work will soon command. The uniform richness of the ore, the quantity of the same, and the facilities or its extraction and shipment, combine to make the mines among the most desirable of the kind upon the continent. . . . Touching mining laws, Governor McCormick says: The act of Congress to legalize the occupation of mineral lands, and to extend the rights of pre-emption thereto, adopted at the late session, preserves all that is best in the system created by miners themselves, and saves all vested rights under that system, while offering a permanent title to all who desire it, at a merely nominal cost. It is a more equitable and practicable measure than the people of the mineral districts had supposed Congress would adopt; and credit for its liberal and acceptable provisions is largely due to the influence of the representatives from the Pacific coast, including our own intelligent delegate. While it is not without defects, as a basis of legislation, it is highly promising, and must lead to stability and method, and so inspire increased confidence and zeal in quartz mining. As, in the absence of necessary legislation by Congress, the act gives authority to the legislature of any State or Territory to provide rules for the location and working of mines to their complete development, it will be your duty to prepare such rules, either by amending the present mining law of the Territory, so as to conform to the law of Congress, or by its repeal, and the substitution of an entirely new statute. Whatever your preference in this particular, I would suggest that care be taken to make the required rules as intelligible and comprehensive as possible, and that the recording and preservation of titles, both for the security of the miner and the capitalist, and to obviate future litigation, be entrusted only to the most responsible officers. It is also important that, excepting in districts where active hostility on the part of the Indians absolutely prevents, the actual occupation and improvement of claims be made a requisite to their possession, unless pre-empted under the Congressional law. The lack of such a requirement hitherto has seriously retarded the development of our mineral resources and the general prosperity of the Territory, and proven discouraging to new comers, especially in the counties on the Colorado river, where hundreds of lodes, taken up in years past, by parties now absent from the Territory, are unworked, and yet, under the existing law, no one has a right to lay claim to them, be he ever so able or anxious to open them.

### Colorado.

The Denver News, Nov. 28th, says: Mr. French, of James Creek Mining District, called on us to-day, showing us some very fine ores from that place. The lodes are numerous, have wide crevices, and are easily worked, the ores assaying rich. About three hundred men are at work in the district. A road from Denver to the heart of this mining region can be built on a water level, at a small expense, and, as it is growing in importance, it might be well for our citizens to secure the trade by assisting in building such a road. . . . The Black Hawk Mining Journal, Nov.

27th says: The past week has been one of great activity in business. All the mills, the foundry, &c., in Black Hawk, are busy, and every vacant lot or space in town is filled with cord wood. . . . A Blake crusher was broken to pieces at the Mammoth mill, Nov. 21st. We don't know how much it will detain the mill. There must be something wrong about these machines, else they wouldn't break so often and easily. . . . At Nevada, the American Flag company have got through the cap and are getting out some very good ore which Mr. Whitcomb is going to run. Mr. W. is now crushing from the California lode, surface pays about \$225 a cord. Mr. Conlee has started the mill, and property of the Gilpin company on the Burroughs. Mr. Cushman is working the Hardesty property. Mr. Mitchel is running the 12-stamp mill in Lavenworth gulch and doing well, taking out something more than 100 ounces a week. The Ophir company continue to make money, and Mr. Vezin's Monnier institution approaches completion. . . . At Argentine, Rothpletz has got a house up, packed in 18,000 of grub and mining supplies, and is going to work about ten men all winter. He is driving adits or tunnels on the Ayres and Watson lodes. Mr. Watson's furnace is to be kept going during the winter on ores from the John Brown lode, situate three or four miles up the right fork, and having 24 inches of mineral, very rich. . . . They have the best crevice of ore ever known in No. 2 Gregory, now. It is about five feet wide in the shaft which is being sunk, and is now 425 feet from the surface, and in the east and west levels, fifty or sixty feet above, it is scarcely less. The ore is sulphuret and oxyd of copper, more of the latter than formerly. Last week and week before, the shaft supplied 40 heavy stamps. The pump works to perfection. . . . The Santa Fe lode, one of the discoveries of the past year, is situate near the head of Gibson gulch, between that and Virginia Canon, and though not very extensively developed, shows the indications of a large, strong, main lode, and doubtless will prove a good mine, when fairly opened. At the discovery a shaft has been sunk and partially timbered, to a depth of about thirty feet, showing a clear, well-defined crevice from four to five feet wide between walls, with about eight inches of very fine looking galena in the bottom, some of which has been hauled to Lyon's smelting works for reduction. On No. 1 west, a prospect pit, ten feet deep, has been sunk, showing a fair crevice, with good looking surface stuff, and some galena. There is also a prospect pit, about ten feet deep on No. 2 west, with very good indications, but no mineral as yet.

### Oregon.

The Oregonian, Nov. 3d, says: Mr. Foster, of Umatilla, called on us last evening and gave us the cheering information that hill diggings were discovered last Friday within a mile and a-half of Umatilla City—up the Umatilla river—which prospect from five to ten cents to the pan. The gold is very fine, but no difficulty is experienced in saving it. Claimants were already putting in sluices when Mr. Foster left, and he thinks it safe to say that no less than a dozen will be in full operation before the close of this week. Water in abundance can be used from the Umatilla river without great expense. The locality where these new mines are found has been traveled over for years without discovery or suspicion of their existence. . . . We learn that the copper mines of Eagle creek are developing very richly. We lately saw some specimens of argentiferous quartz from that district which, after scorching, was thickly studded all over with silver globules. Eagle creek district is assuming considerable importance as a mining region. . . . The "Sucker Hole" company, on Canyon creek, week before last, took out \$900 in five days work. Other claims on the same creek are reported as paying quite as well. . . . The Lightning Gulch quartz ledge, about five miles from Kerbyville, is still paying. This lead, it will be remembered, is the one which caused so great an excitement at its discovery last spring. So says the Sentinel. . . . The sources of wealth of Clackamas county are briefly mentioned by the Oregon City Enterprise thus: "The chief characteristics are based upon the unsurpassed water privileges in the county. This, at Oregon City, is abundant enough to supply manufactures more than equal to Lowell and Lynn, Massachusetts, and the use already made of a portion of it is evidence that it will be availed of largely in future years. At Oswego the Oregon Iron company have already started an enterprise which is more promising than any similar establishment upon the Pacific coast. The iron beds in that locality are inexhaustible, and the water privilege very greatly superior to ordinary privileges. Milwaukie also enjoys the facility of an abundance of water for the purpose of manufactures, and already has works which would be a credit to larger communities. The mountains to the east of Oregon City contain gold, but this is a secondary consideration. In agriculture the county is very rich. There is scarcely an acre of ground in the county that will not prove valuable under proper cultivation."

### New Mexico.

The Santa Fe Gazette, Nov. 24th, says: The news from the gold diggings near Fort Stanton is not so

favorable as it was some time since. Those who have made the experiments of digging during the last six weeks have not been able to make it pay—the cause, we believe, is a deficiency of the precious dust. . . . Four years ago and Hatch's rancho was the only settlement in that portion of New Mexico. It is now the white man's country, and the Comanches and Apaches know but little about it. So thickly is it settled that single persons travel in security from Fort Union, Las Vegas and Tecolote to Fort Sumter away down on the Pecos, hundreds of miles, and to Fort Bascom on Red river; from Fort Bascom to Fort Sumter; from Fort Sumter to Fort Stanton, and from Fort Stanton back to the Rio Grande at Mesilla. On the western and southwestern frontier there is an almost similar impunity from hostile Indians.

### Maryland.

BALTIMORE, Dec 12th.

#### EDITOR JOURNAL OF MINING:

SIR—The only mine in Maryland which pays handsomely for working is the "Liberty mine," Frederick county, yielding a gray and blue copper ore of 70 per cent. The Springfield Barr Hill and other mines are not any longer productive of profitable results. The "Liberty" bids fair to become another "Acton mine."

#### Coloradian Experience in Stamp Mills—The Lighter the Stamps the Better.

In the course of an article on Stamps, the Black Hawk Mining Journal, Nov. 13th, says: Mr. Belden is to-day employing four different stamp mills, counting a section of the Black Hawk Company's new mill as one. Of these four mills, the old Empire mill, which is like our first crop of stamp mills—having narrow and close batteries and 450 lb. stamps dropping thirty times a minute—is doing by far the best. It is a well known fact that the old Briggs mill, which had 450 lb. stamps dropping thirty times a minute, never ran a day without making money, whereas the new mill with 880 lb. stamps dropping twenty two times a minute, is idle to-day because it won't make any money. When the Smith & Parmelee Company built their mill, which is a heavy-stamper, they employed both their own and the Briggs mill, and Ben Smith declared that it would pay him to let his mill stand idle and give the Briggs mill \$75 a cord to crush his ore. Mr. Bertola says that thirty years experience in quartz milling has taught him that Colorado has made the biggest mistake in the world in investing so largely in heavy, slow-moving stamps. He says, never make a stamp weighing more than 350 lbs. When they first began to mine in California they made their stamps weigh nearly a ton. In a few years they came down to a thousand lbs. Later they have fallen another 100 per cent., and the business of quartz-mining improves in proportion. They are just adopting a quartz crusher, combining, like Gardner's, a grinding and crushing motion, which, with the aid of one man, daily crushes to the fineness of peas or rice, sufficient rock to supply 40 stamps; thus performing more than half the work of the stamps, saving half their wear and tear, consequently much of the cost of crushing the rock. The machine is called "Brodie's Quartz Crusher." It is probably not superior to Blake's, Gardner's, or Dodge's, many of which are already in Colorado, and some of them in use. It would seem that the advantage of using these machines is not generally understood. By crushing the rock to a uniform size, it enables the stamps in the batteries to always fall on an even surface, and thus operate with more uniform effect in crushing, and it saves the breaking of shoes and dies, by leaving no large pieces of hard rock for the stamps to fall on unevenly. In the account of the Victoria works, which make a profit on \$2-rock, published by us lately, we find that "the quartz is supplied to the batteries by a self-feeding apparatus, requiring the attention of one man only to sixty stamps." Why cannot we profit by these full-set examples of our neighbors? Here it is a man's work to feed a section, or twenty stamps. Again, the simplest means for amalgamating are the favorites both in Australia and California. Quicksilver is bestowed in a thousand ingenious little hiding places, over which the crushed ores must pass. Blankets are the stand-by, however, and their use seems to result in complete success. Indeed it is hard to conceive how gold can be carried over from ten to fifty feet length of blanketing by the sluggish current of water usually run from the stamps. In Australia, where they make the poorest rock pay, the battery screens have 120 holes to the inch, and the ore from the batteries passes over twenty-four feet length of blanketing. We go to the trouble of publishing and re-publishing these things in the hope that some of our mill-men, or all of them, will act on the suggestions, which are eminently practical. Except in the matter of heavy stamps, the improvements we speak of would cause no detention nor expenses. And let nobody ever again have a stamp made weighing more than 450 lbs. There isn't a mill-man of any

experience in the Territory who is not already convinced that light stamps, dropping faster, will do a great deal better work than such as we now universally have. Make the batteries so that there should be absolutely no space below the face of the dies, break the ore as fine as peas with a quartz crusher, of some kind, there are enough of them, and then

lay down blankets to catch the gold. With this for treatment, and an average mine, systematically opened by shafts and galleries, so as to always have paying ground in sight; with a mine-pump and power to run it and hoist ore; with no sinecure offices to be filled at big salaries; with a careful manager, who is honest and energetic, and knows the value of

money—all of which, in most cases, are easily attainable; and, finally, with a railroad to the base of the mountains, conferring a thousand benefits it is needless to specify, the cost of quartz-mining and milling in Colorado may be reduced from \$15 to at least \$10, if not \$5, per ton. But we have strayed from our immediate subject.

GOLD.

Table with columns: COMPANY, SHARES, STOCK, SITUATION OF MINE, SECRETARY & PLACE OF BUSINESS. Lists various mining companies and their details.

LEAD.

Table with columns: COMPANY, SHARES, STOCK, SITUATION OF MINE, SECRETARY & PLACE OF BUSINESS. Lists various lead mining companies and their details.

SILVER.

Table with columns: COMPANY, SHARES, STOCKS, LOCATION OF PROPERTY, SEC'Y AND PLACE OF BUSINESS. Lists various silver mining companies and their details.

COPPER.

Table with columns: COMPANY, SHARES, CAPITAL, SITUATION OF PROPERTY, SEC'Y. AND PLACE OF BUSINESS. Lists various copper mining companies and their details.

S, means section, T, to wnsp, E range.

# AMERICAN Journal of Mining.

[ILLUSTRATED.]

GEORGE FRANCIS DAWSON,  
EDITOR

By publishing contributions, the JOURNAL OF MINING does not necessarily endorse the positions assumed by contributors.

OFFICE, 37 PARK ROW, NEW YORK.

Published Every Saturday Noon.

## TERMS:

SUBSCRIPTION.		ADVERTISING.	
Per annum, one copy	\$4 00	One line (Nonp) 11 inser'n.	\$3 30
Six months, one copy	2 25	One Square, 10 lines, one do	2 00
Three months, one copy	1 25	One Square, do. four do.	5 00
Single copy	10	One Square, do. one year,	40 00

Canadian subscribers 25 cents extra for postage.

Specimen copies sent free.

Liberal reductions to permanent advertisers.

DESIGNING, LITHOGRAPHING, WOOD ENGRAVING, and JOB PRINTING

Executed in elegant style, on reasonable terms.

Address WESTERN & COMPANY, Proprietors,  
No. 37 Park Row, and No. 145 Nassau Street, New York City

## AGENTS,

AUTHORIZED TO RECEIVE SUBSCRIPTIONS AND ADVERTISEMENTS.

COLORADO—Geo. TRITCH, Denver City.  
" W. S. STANLEY, JR., P. M., Mill City, Clear Creek Co.  
" D. M. RICHARDS, City Book Store, Central City.  
" R. C. MILES, P. M., Golden City, Jefferson county.  
CALIFORNIA—W. E. LOOMIS, San Francisco.  
MASSACHUSETTS—S. M. FETTERGILL & Co., Boston, Mass.  
MEXICO—Messrs. R. C. BARKSDALE & Co., proprietors of the American and Mexican News Company, and Agencia General de Libros, City of Mexico, Primera Calle de San Francisco, No. 13; Vera Cruz: Calle de Maria Andre, No. 627.  
In Guanajuato, Real del Monte, Guadaluajara, Durango, San Luis Potosi, and all other mining districts of Mexico, the correspondents of Messrs. R. C. Barksdale & Co. are the only authorized agents of the JOURNAL.  
PENNSYLVANIA—A. WINCH, Philadelphia, Pa.

Correspondents, exchanges and others addressing us should be extremely careful to write "JOURNAL OF MINING," instead of "MINING JOURNAL," to ensure safe carriage.

NEW YORK, SATURDAY, DECEMBER 15.

## Contents of this Number.

EDITORIALS.—The Late Appalling British Colliery Explosion—Where the Blame Should Rest.—Honor to Whom Honor.  
CORRESPONDENCE.—British Mining.  
ORIGINAL PAPERS.—Effect of Exposure on Coal—Mineralogical Sketches of the Counties in Scotland, No. 6, by H. Dunscombe.—The Electro-Positive Metals, No. 7, by Jos. Hirsh, Ph. Dr.  
ILLUSTRATED MACHINERY.—Watts, Campbell & Co.'s Horizontal Steam Engine.  
SCIENTIFIC MEETINGS.  
MINING SUMMARY.—News from Nevada, Pennsylvania, California, Montana, Michigan, Idaho, Arizona, Colorado, Oregon, New Mexico, Maryland.  
MISCELLANEOUS.—The Best American Ores of Iron—Largest Iron Works—Ansell's Fire Damp Indicator—Quicksilver—Remarkable Discoveries in Minnesota.  
POETRY.—There's Work Enough to Do.  
SPECIAL SCIENTIFIC BREVITIES, MINERAL AND OTHER ON-DITS.  
ALL SORTS.  
MINING COMPANY MEETINGS—DIVIDENDS.  
PATENT CLAIMS.—Important to Mill Men, Miners, Metallurgists, Oil Men, etc.  
TABULAR MATTER.—Gold, Copper, Lead and Silver Mining Companies; Names, No. of Shares, Capital Stock, Situation of Mine, Name of Secretary and Place of Business.  
MARKET REVIEW.—Mining and Petroleum Stocks, Finances, Stocks, Metals, etc.  
THE COAL TRADE.—Quotations, Shipments, Freights, Cargo Rates, Weekly Coal Trade Circular.  
FOREIGN MARKET REVIEW—Metals, etc.  
NEVADA STOCKS.—Latest advices by Telegraph.  
NEW YORK METAL MARKET.

## THE LATE APPALLING BRITISH COLLIERY EXPLOSION—WHERE THE BLAME SHOULD REST.

A telegram from England states that a frightful explosion occurred in a colliery at Barnsley, Yorkshire, on the 12th inst., that the bodies of over three hundred dead had already been taken from the mine, and many others were still unaccounted for. A subsequent dispatch informs us that on the following day a second explosion took place in the same mine, while a large number of miners were endeavoring to save the survivors of the previous disaster, and thirty additional lives were lost. A third dispatch from London states that another terrible explosion had taken place in a colliery in Stafford, and was attended with great loss of life.

It is plain that these appalling disasters are to a certain extent attributable to the authorities and laws of Great Britain, by whom and under which miners can be imprisoned if they refuse to work in a dangerous coal mine. On page 152, vol. II. JOURNAL OF MINING, was given, from an English paper, an instance of this sort wherein three miners who

were afraid to work in a coal pit at Mirfield, England, because it was so full of fire-damp, were imprisoned for 14 days by order of the Dewsbury, West Riding Justices, although it was proven by witnesses that they were compelled to work eighty yards from the draught of air. It is idle to attempt to justify any such law as that under which these Dewsbury Justices must have acted, by saying that there "perhaps was a contract in the case"—for such does not appear on the face of the report, and is not likely to have existed except in so far as every agreement to go to work for wages may be considered a contract; and even were it a special contract to certain specified work within a given time, no decent, proper, just, reasonable law (and law, says Blackstone, is the essence of reason) should compel a man to finish the job, if in the middle of it he finds that to do so will probably involve the loss of his own life or the lives of others, and under no ordinary circumstances can it be right to make the breach of a civil contract a criminal offence. If the miner violates his contract the remedy is plain—he forfeits his wages to the extent of the damage done by the non-fulfillment thereof; and if his wages do not cover said damage, then it is the fault or *laches* of the employer for not demanding adequate security for the fulfillment of the contract. But even this is only a one-sided view of the case. If there be an *express* agreement between mine-owner and miner—the one to pay certain wages, the other to do certain work—there is also an *implied* agreement by which—in consideration of the known and unknown dangers to which the miner, while working in the deep, dark, gaseous coal caverns of the earth, is continually exposed—the mine-owner obligates himself, by proper pumping, timbering and *ventilation*, to secure the health and life of the miner. The Dewsbury Justices do not seem to have taken this view of the case, and have thus not only robbed their country of its once proud, but now unmeaning boast, that "Britons never, never, never shall be slaves," but perhaps have been instrumental in causing the wholesale slaughters referred to in the above dispatches; for with such penalties staring the poor fellows in the face, it could hardly be supposed that they would refuse to work, no matter how perilous they might consider the collieries. There are often many mouths to feed in a collier's family; his earnings, God knows, are little enough for it, and he dare not risk the 14 days in prison that grim Justice would give him for refusal to work because of the danger. Some persons may perhaps be found who take the ground that these dreadful explosions are nearly always occasioned by the carelessness of the coal-miner, in handling his "safety"—a most ridiculous assumption, when we remember that perhaps, in nine out of every ten cases of British colliery explosions, the blame can be traced to no person at all, and were probably caused by spontaneous combustion, or perhaps to a spark born of the contact of an iron or steel implement with rock, while the remaining tenth case may be occasioned by a new hand—perhaps one who had worked all his life in tin or copper, and in a moment of forgetfulness is careless. But the true coal-miner is always careful, because he knows too well the fearful perils that environ him in the coal depths, and he ever seems to see, peering through the surrounding darkness, the hungry, pleading eyes of his little children, begging him to be cautious for their sake, if not for his own. Some may say, "Why does not the miner inform the colliery inspector of the dangerous condition of the mine?" Little good would that do. He is too frequently afflicted with blindness, owing to pecuniary causes; and if he took the trouble to report, would declare the mine safe, whether truly so or not, and the miner who complained would be turned out of the mine without a "discharge-note,"

and must starve, because without a document of that sort from his last employer no miner in England can get work. The whole matter, then, can be reduced to these propositions: First, any British law obliging the miner to work in a dangerous mine should be repealed. Second, a law should be enacted declaring it a penal offence for any mine manager, by direct or indirect means, to force a miner into an unsafe mine. Third, illy-ventilated coal mines should, by Act of Parliament, be made to revert to the crown. Hundreds of forms now clad in the ceremonies of an untimely grave demand some such legislation, and thousands of weeping widows and fatherless little ones repeat that demand, even as a mere matter of national policy, if from no worthier motive, the British government should press such enactments through Parliament. Men are getting scarce in England—so scarce that the gaps in regimental ranks remain unfilled; vessels of war ordered on foreign service lie in her ports inactive for want of crews, and many mines cannot resume work for lack of miners. There is a reason for this scarcity, viz.: the superior advantages offered by the United States. The British miner especially looks to this country as an earthly Paradise which he must ever strive to reach; wherein there are no discharge-notes, no Dewsbury West Riding Justices, no colliery explosions, no tyrannical Joe Skeards, no hunger nor thirst among the industrious where there are plenty of mines, fair work-hours, good wages, cheap lands; where education and position and wealth are open to all; where "the greatest good to the greatest number" is the rule and "the tyranny of small minorities" the exception; the laboring man is the equal of any in the land and each of us are proud to call him:

Man, my brother! man, the worker! Ever reaping something new,  
That which thou hast done, but earnest of the things that thou shalt do;

where nobility is neither bought nor inherited, but earned by noble deeds; where every man can become a citizen, and every citizen has one vote, and the poor man's vote is as powerful as that of the rich man; and where the rule "by Divine Right" is ignored as a fiction of the Middle Ages, and the rule by right of the People is proclaimed and adhered to with the happiest results. What wonder that men should leave that land for this!

## "Honor to whom Honor."

Everybody interested in the encouragement of efforts for the practical advancement of science, will rejoice to learn that, in all probability, Congress will unanimously pass a concurrent resolution of thanks to Cyrus W. Field for his great services in connection with the laying of the Sub-Atlantic Telegraph Cables. Senator Morgan has already presented the resolution to the Senate. The thanks of his own nation will, doubtless, be far more gratifying to Mr. Field than a British baronetcy.

## Scientific Meetings.

## GERMAN POLYTECHNIC ASSOCIATION.

NITROLEUM IN BLASTING OPERATIONS—LETTING OFF BLASTS BY ELECTRIC AGENCY.

At the last meeting of the German Polytechnic Society—Mr. Mueller in the chair—Mr. Kinkel read a paper on nitro-glycerine, or nitro-leum, in which he gave a detailed description of the first experiments made by Professor Nobel. He then dwelt somewhat on the present methods of using it in blasting operations. The hole should be drilled to a depth of sixty inches, and is then filled to one-third of its height with nitro-leum, the rest of the opening being filled with sand or water. The nitro-glycerine was usually contained in a box or cartridge, which is introduced, and is provided with a fuse. The question turned up, whether nitro-glycerine could be exploded by the



electric current. Mr. Kunkel spoke of some European experiments in this direction, where a platinum wire, communicating with the blasting or in a cartridge, ignited the charge by means of an exceedingly strong galvanic current. An ordinary electric discharge, sufficient for the explosion of gunpowder by means of an appropriate fuse, failed repeatedly to have the same effect upon nitro-glycerine. The means proposed for the safe preservation of the blasting oil, as its solution in wood naphtha, was referred to, and after a brief resume of the commercial status of this article of manufacture, the meeting adjourned.

AMERICAN INSTITUTE—POLYTECHNIC BRANCH.

At the meeting of the Polytechnic Branch of the American Institute, on Friday evening, the Secretary, Dr. Tilden, exhibited the form of patent newly issued from Washington. The well known picture of the Patent-office is replaced by an allegorical representation which did not apparently meet the approval of the meeting. The specification is printed instead of being written, but it was noticed as singular that only ten copies are printed. The patent was enclosed in a neat water-proof bag of India rubber paper. The Secretary also read a communication on the vowel sounds, after which Dr. Vanderweide illustrated La Place's theory of the correlation of forces and the manner in which atoms were aggregated in forming the worlds. Mr. Maury read a paper on ocean currents, tending to show that they are produced by a centrifugal force acting upon water of different degrees of density. He said that if cork, water and quicksilver could be whirled round in a basin, the different substances would take distinct places near to or further from the centre of the basin, according to their relative weight; and that this was also the case with warm water and cold, the former having a decidedly less density than cold water. Also, that the water at the equator was raised to a height of thirteen miles above its natural level by centrifugal force, and that it had consequently a down-bill course towards the poles. Professor Grahams then proceeded to illustrate his theory which he had previously brought before the Society, that there were now five, and had been originally six oceans, lying in pairs, north and south of each other, the North and South Pacific Oceans, North and South Atlantic Oceans, and the Indian Ocean, and what had formerly been the Northern Indian Ocean. That in each ocean was a current, each in shape of an ellipse; that this was occasioned by the same natural law which would cause the motion of a ball on a table to take the same course if rolled from the periphery to the centre of a table which was revolving; that these currents had worn away the continents into the shape they now presented, and which were somewhat similar in all the continents; that the high land was produced by the washing away of earth which settled at the centre of these ocean currents, producing a depression of the crust beneath them and a consequent rise of the adjacent land. That every minute detail bore out this view—for instance: That the current in the North Pacific stretches southward as far as California, and then, hundreds of miles from land, turns west again; the current in the South Pacific acts in a similar manner opposite Peru. If the heat of the water were the sole or prevailing cause, the two currents would continue south and north until they met at the equator, and if they were deflected by the land they would flow on until they reached the land. He stated that Herschel and others were in favor of this theory of depressions. Also, that the winds were influenced by very different causes from those which produced the ocean currents; that the water had to travel many thousands of miles before it could become cooled; not so with the air, which had but to rise four miles at the equator and it would become as cool as if it travelled to the poles; consequently the air at the equator did rise, and was also affected by the motion of the earth as the water was; but falling down as soon as it got cooled, it produced its ellipse in a smaller space—hence there were many more currents of air than of water. The fact of the oceans being opposite each other, directly north and south, was caused by the alternative seasons.

**MEETINGS.**  
West Columbia Coal Co., at 137 Broadway, Dec. 20; Corydon Mining Co., at 33 Wall street, Dec. 17, at 12 m.; Central Gold Mining Co., at 17 Nassau street, Dec. 18; People's Petroleum Co., at 68 Broadway, Dec. 18; American Coal Co., at 111 Broadway, Dec. 27; Ravine Petroleum Co., at 60 Wall street, Jan. 28, 1867.

**DIVIDENDS.**  
Butler Coal Co., at 411 Chestnut street, Phila., also at Farmers' Loan and Trust Co., this city, \$1 per share, free of tax; Ralston Oil Co., at Pittsburg, Pa., 2 per cent., on demand; Marine Oil Co., same place, 5 per cent., on demand. Dividends for November have been declared by the following Nevada companies: Hale & Norcross, \$100 per foot; Savage, \$100; Yellow Jacket, \$75; Crown Point, \$50; Imperial, \$8 per share, Empire Mill, \$15.

Correspondence.

[To insure insertion of Correspondence in our columns the full name and address of the writer must be given.]

British Mining.

EDITOR JOURNAL OF MINING:

SIR—From an article in the London Quarterly I observe that the condition of British mining, by their own accounts, is far from promising. The continued low prices of tin and copper press very heavily on the mines, "which are now, in nearly all cases, worked to great depths, and at heavy cost." The wages of miners in Cornwall and Devonshire are reduced, we are told, and emigration is taking place to an unusual degree. Out of 619 mines recently active, 238 have suspended operations. For the miners thus thrown out of work, there is encouragement enough in the United States. The quantity of tin ore raised in 1865 in England was 15,686 tons, from which were obtained 10,039 tons of metallic tin. There were 203 copper mines in the United Kingdom sending ore to market. These produced 198,298 tons of ore, from which were smelted 11,888 tons of copper. But the price of ore, however, and its produce have, for several years, steadily declined; and as no important discovery of any new deposits of copper has been made, it is inferred that copper mining in the British Isles has seen its best days. The produce of lead ore in 1865 was 90,452 tons. From this was obtained 67,181 tons of lead and 724,856 oz. of silver. The Welsh mountains produced 1,664 oz. of gold. The coal and iron products are, of course, the most important in England. In 1865 the 3,256 collieries yielded 98,150,587 tons. Seriously apprehending a short supply, if not an exhaustion of the coal fields, perhaps within the present century, the House of Commons has appointed a Royal Commission to inquire into the waste of coal in its mining and in its consumption, the depth to which it may be worked, and the existence of coal in the E. counties. Their report is evidently awaited with anxiety. N.

Original Papers.

EFFECT OF EXPOSURE ON COAL.

By ALFRED P. ROCKWELL, Professor of Mining in Sheffield Scientific School of Yale College.

The deterioration which coal suffers from exposure to the weather is far greater than the majority of people suppose, especially if their attention has not been called to the subject. The importance of keeping it as dry as possible from the time it leaves the mine till it reaches the stove or furnace seems to have escaped notice. The consumer orders his coal of the dealer without asking the question, if it is freshly mined, and has been kept well sheltered under a tight roof, or whether it has lain for months in a great heap, exposed to the showers and sun of summer, or to the storms and alternate freezing and thawing of winter; and yet these are points well deserving attention, as recent investigations have most clearly shown.

Different kinds of coal are differently affected by this exposure; some to a far greater degree than others, but all are more or less injured.

Anthracite suffers least, as might be inferred from its hard compact structure and glassy surface, which render it more impermeable to moisture. The igneous action which has converted it from bituminous to anthracite has driven off the greater part of the volatile ingredients, and left the residue less liable to decomposition.

The cannel coals rank next in power of resisting the action of the weather.

The bituminous coals are the most affected, and these again in different degrees according to their hardness and compactness, and the amount of bituminous matter (so-called) which they contain.

The effect of exposure on this last class of coals has recently been most carefully and thoroughly investigated by Herr Grundmann, at Tarnowitz, in Germany, and the results published in the *Zeitschrift für das Berg Hütten, und Salinenwesen in dem Preussischen Staate*, for 1866. Some three years or more ago he had made a series of experiments of a similar character, and found that the coal exposed to the weather in heaps lost during a period of nine months 50 per cent. of its value as fuel. This result, so astounding, raised doubts in the minds of others of the accuracy of his observations and conclusions. He has accordingly now instituted a new set of experiments to correct or verify his former ones.

Meanwhile, Herr Varrentrapp, of Brunswick, experimented in his laboratory to the same end. He caused a current of air, free from carbonic acid, to pass through a vessel containing moist coal, and thence through a solution of Baryta. Carbonate of Baryta was precipitated. The fact was thus established, that at ordinary temperature oxidation of the coal and the formation of carbonic acid took place, and that the quantity of the latter was much increased by raising the temperature. He found also that in three months with the heat kept uniformly at 284° F., (140° C.) all the carbon in the coal had passed off as carbonic acid. And yet this degree of heat is far less than is sometimes evolved in great heaps of freshly mined coal. These experiments went to confirm the results first obtained by Herr Grundmann.

The latter in his new experiments takes small coal, with no pieces more than two inches in diameter, of three different kinds, and got from three different mines. Of them he makes in the open air three separate heaps from 4 to 5 feet high, and 20 to 30 feet in diameter at their base. The coal was the best coking and gas coal in Upper Silesia. From time to time during the year of exposure, average samples, selected with the greatest care, were taken for rigid and accurate analysis.

Large coal in pieces of 3 or 4 pounds weight, was also included in the investigation, but it was kept under cover and not exposed as were the heaps of small coal.

It is unnecessary to give in detail the mode of proceeding. It is enough to know that no labor was spared to ensure entire accuracy. The results fully confirm the correctness of his former experiments, and his conclusions may be briefly stated as follows: That during the period of exposure, the coal underwent a process of slow combustion, taking up oxygen and giving off the volatile products of oxidation. In this decomposition air and moisture play the principal part, and warmth is the condition promoting it. The degree of heat determines the rapidity of the process. The heat developed may be sufficient to ignite the inflammable gases, as is not unfrequently shown by the spontaneous combustion of large heaps of coal, and by the fires in the mines themselves. That the decomposition was the same in the interior of the heap as on the surface; it being equally rapid at both points. That the action was most rapid during the first few weeks of exposure, the heat generated by decomposition reaching its maximum about the third or fourth week. That one half the oxygen absorbed was taken up during the first 14 days. The well known rapid heating of freshly mined coal, and the fact that coal long mined is far less liable to spontaneous combustion, may be adduced as corroborative evidence of this. That a coal originally poor in oxygen, decomposes more rapidly than one rich in it. That coal dried at a temperature of 212° Fahrenheit till its weight remains constant can be heated up to 392° Fahrenheit (200° C.) without further loss of weight. Hence moisture is an active element in the decomposition. That large coal exposing less surface to the action of air and moisture than small coal, is much less rapidly decomposed. The tendency, however, of large lumps having joints, to fall to pieces, on exposure is well known.

The analysis of the freshly mined coal of the several heaps gave the following composition:

	I.	II.	III.
Carbon	76.51 per ct.	78.32 per ct.	81.21 per ct.
Hydrogen	5.32 "	5.04 "	5.38 "

Nitrogen	0.92	0.88	0.89
Oxygen	5.83	8.08	5.72
Sulphur	1.08	7.65	0.77
Ash	10.34	7.02	6.03
	100.00	100.00	100.00

The results of the experiments is as follows

	SMALL COAL IN HEAPS.		
	I.	II.	III.
Absolute loss of weight	33.08 p. c.	44.61 p. c.	42.19 p. c.
Loss of value as fuel	47.69 "	56.81 "	55.38 "
" " for gas	45.51 "	47.95 "	50.29 "
	LARGE COAL KEPT UNDER COVER.		
	I.	II.	III.
Absolute loss of weight	10.69 p. c.	6.36 p. c.	3.19 p. c.
Loss of value as fuel	12.59 "	9.04 "	4.66 "
" " for gas	23.93 "	16.22 "	14.24 "

The great deterioration in quality of the coal from exposure to the weather, is thus most conclusively shown. It consists in the loss of the valuable combustible ingredients, and a relative increase of the injurious ones, sulphur, oxygen and ash.

The coking quality of this weathered coal was also carefully determined. The three coals yielded when freshly mined a firm, coherent coke, of very good quality. After exposure their character was quite changed. One of the coals at the end of eleven days yielded no coherent coke at all, while from the two others a coke was got, but of quite inferior quality, and the longer the coal was exposed the poorer was the coke.

For gas purposes also, the weathered coal had seriously deteriorated, as the above figures show. That they are not exaggerated it is only necessary to instance an experiment made with considerable quantities of coal at the gas works at Kattowitz. The coal yielded when fresh 1,348 cubic feet of gas to the ton. During one month a quantity of the same coal was kept in bins under cover, and another portion exposed without cover. The yield of the former was 1,116 cubic feet, and of the latter 950 cubic feet per ton. Here there is a loss in a single month in the sheltered coal of 17.21 per cent., and in the exposed portion of 29.52 per cent.

In view of these facts it would seem to be the interest of the miner and dealer in bituminous coal, to see to it that the coal be kept from exposure as far as practicable, that it should never be piled in heaps while wet, and never in great quantities even when dry. And these are points in which all gas-works and other consumers of this kind of coal are more especially interested, for they must in the end pay for this waste of combustible material. That this subject of protecting a valuable fuel so liable to deterioration has not met with the attention its importance deserves, must be evident to any one who has observed the great heaps entirely unsheltered in the coal yards of many of our large cities.

[WRITTEN FOR THE JOURNAL OF MINING.]

#### MINERALOGICAL SKETCHES OF THE COUNTIES IN SCOTLAND—No. 6.

By H. DESSAULT, Prof. Ind. Chemistry to the French Polytechnic; Chemist to the French Imperial Laboratories, etc., etc.

**PERTH-SHIRE.**—The Grampian mountains run through this county, in which the primitive strata occur, covered occasionally by the secondary strata. The interesting scenery of the Trosachs contains the following strata. At Bridge of Doune, 8 miles from Stirling, occurs old red sandstone, succeeded by grey wacke at two miles from Callender; and that one-half mile further by mica slate. Along Loch Venachar and Loch Achray to the Trosachs, on the east, is gray wacke, and on the west mica slate. Lady's Isle, in Loch Katrine, is mica slate. This continues to Loch Lubnaig, where limestone occurs, and two miles from Loch Erne Head a foliated limestone is wrought 40 feet thick in mica slate. The latter continues to Killin and Aberfeldie. About three miles from Taymouth is chlorite slate. Around Comrie is conglomerate rock, and on to Arduch till it enters the Ochills, where it changes to porphyry slate. At Aberfoyle is a quarry of roofing slate. In the vicinity of Callender is a pudding-stone rock, which, with slate and limestone, each a mile asunder, runs in three parallel lines; 1st, the slate, from Luss to Dunkeld; 2d, the limestone, from Buchanan to Comrie; 3d, pudding-stone, from Gartmore to Crieff. Free-

stone at Kingoody, Logiealmond, Birnamhill, Nesotyle, etc. The Hill of Kinnoul is considered as rich in jasper, sulphate of baryta, rock crystal, chaledony, rhomboidal calcareous spar, amethyst, barnstone, heliotrop, etc. Some maintain that the rock is a slaggy lava. Lead mines have been wrought for some years at Tyndrum, Glenlyon, Benledi, etc. At Tyndrum are found galena, copper, pyrites, copper green, red cobalt ochre, heavy spar and blende, in veins traversing quartz. In Rannach of Beneloe, and Craig Cailleach, near Killin, is rhutite in limestone; in Glentilt, compact limestone, bronzite and spar.

**ROSS-SHIRE.**—This county has been little examined. Great part of it is mountainous. Sandstone occurs in Tarbet, Killearnan, Ferne, etc.; a bed of marl of 70 acres in Roskeen; white and variegated marble at Knockirny, in Kincardine, and beds of shells on the tops of mountains far from the sea. At Ankerville, in Nigg parish, one mile from the sea, is a bed of oyster shells one-half foot deep and three feet below the surface; beneath it is sea sand. At Kincardine are apatite and cinnamon-stone in gneiss and orbicular granite, like that peculiar to Corsica. At Kishorn, in Applecrass parish, good marble and copper ore; in Aines, silver ore and a vein of lead.

**ROXBURY-SHIRE.**—Coal in small quantities in Castleton; lime and sandstone in South Dean, Hobkirk and Castleton parish, and lime and marble at Erthford. At Robert's Linn, in Hobkirk, crystals of quartz have been found. Fibrous gypsum at Kelso, marble in Lillie's Leaf.

**RENFREW-SHIRE.**—This county abounds in coal, lime, ironstone, freestone and trap. The Pasmadie coal, near Glasgow, occurs with freestone and ironstone, dips towards Clyde, and is 95 fathoms deep. Quarrelton coal occurs with whin, which is rare, is 50 feet thick and is wrought in stories. Ironstone and limestone occur above coal at Cathcart, Blackhall, Hurlet, Darnly, Muirhead, etc. The Hurlet alum works are well worthy of a visit from Glasgow. Above lime and coal lies a bed of alum slate from three and a-half feet to six inches thick. It is hard, effloresces on exposure and falls to pieces, is lixivated, thrown into wooden troughs with water which is collected, and by boiling with iron gives green copperas. The mixed alum and copperas are decomposed by potash. The alum is made then to crystallize. A stranger will be highly pleased with a trip from Glasgow to this place, where he will see alum pits and works, copperas works, coal mines, freestone quarries in which petrified trees have been found, and by going three or three and a-half miles further he will see cotton and flax mills, bleach works, print works, etc., without number at Barkhead. Whin is found at Cathcart, Elderslee, Craigton of Erskine, etc., whence the great quantities used in the embankment of Clyde of Clyde are brought. Freestone is quarried to great extent in Cathcart parish, around Hurlet, and near Paisley. Marine shells have been found far below the surface in the track of the Ardrossan canal; petroleum at Hawkhead, copper, teolite and octahedral fluor spar at Gaurack; prehnite at Bishop-ton, and at Hartfield, near Paisley, in trap. At Hurlet native copper, sulphate of iron, magnesia and crystallized sulphate of lime. Teolites and cubical spar in the trap rocks between Bridge of Weir and Port-Glasgow.

**SELKIRK-SHIRE.**—This small county is remarkable only for the absence of all useful minerals. No coal, lime, nor freestone are found in it; abundance of shell marl in Selkirk parish, granite and mica-cous schist in the hills.

**SHEPHERD-SHIRE.**—In the south end of main land are clay, slate, gneiss and mica slate, near Yell Sound, the epidotite syenite is 15 miles in length, and one and a half miles broad. On the east side of mainland from Lumburg head to Movsa, Bressay, Ness, etc., occurs a sandstone free from extraneous masses, and north from it one full of them. From Cliff hills to Bowie head, clay slate, quartz and hornblende slate. From Yell Sound limestone may be traced eighteen miles, being 1200 to 1400 feet thick; at Great Avery it is five miles long; at Uslaness eight miles long, and 160 feet broad. Mica slate abounds in Eswick, Linga, Isbiter, etc.; gneiss

at Whalseyneap, and in the same line at one of their outer skerries; granite at Sandstine, syenite at Caserroe, at Ursh diallage rock seven miles long, two miles broad. Papa stour on the west side of mainland, presents compact felspar, felspar porphyry and clay slate, and at Kirksands anygdaloid rock with calcareous heavy and fluor spar, quartz chaledony, green earth, jasper, etc. In Festlar Island, serpentine chromate of iron, Diallage rock, chlorite slate, glossy alum, slate, bog iron, copper ore, plumbago, asbestos, rock crystals, fuller's earth, etc.

**STIRLING-SHIRE.**—This county abounds in coals, lime, and ironstone. In the parish of Muiravonside, Palmont, St. Ninian's, Larbert, Kilsyth, etc., there is a ridge of hills runs through it, called the Campsie fells, which gives a prevailing character to its rocks.

These are 22 miles long, 6 to 10 miles broad, the convex side being uniformly to the west, and 1200 or 1500 feet high.

On the road side, on the top of Take-me-down hill, is a fine vein of heavy spar. The principal rocks are trap, sandstone, limestone, slate clay, bituminous shale, clay ironstone, coal, and clay marl. Under the soil is trap, from 70 to 100 feet thick, often columnar, and which is particularly so about Murray Hill. The iron ore is lenticular, and that near Kilsyth is very productive. Kilsyth is very remarkable for its coal, ironstone, limestone with marine shells, its heavy spar, alum slate, copper ore, jasper, agates, and porphyry. Slate and alum are wrought at Campsie. At Fintry is a range of 70 columns of basalt, some 50 feet high, and at the spout of Balagan in Strathblane parish, is a hill presenting 192 strata of limestone and other rocks. Near this, pure alabaster has been found.

At Airthrey, near Stirling, in 1819, the bones of a whale were found at a depth of four feet. It had been 72 feet long, the ribs were 10 feet long, and near twenty feet higher than the water of the Forth.

**SUTHERLAND-SHIRE.**—The coast of this county has been examined by practical miners. There are mountains of quartz rock at Assynt, with compact gneiss, hornblende slate, and syenetic greenstone. Here is a great deposit of limestone alternating with the same rock. It lies in two thick beds with granular quartz between them. The marble is of excellent quality. Fluor spar, zircon and epidote occur in the Sutherland gneiss.

Rock crystals occur at Rongue, bad coal at Brara, veins of lead and iron ore in Strathnauer, black oxide of manganese in the path of Dornoch, freestone and slate in Galspie and Loth, and limestone in Durness.

**WIGTON-SHIRE.**—Little can be said respecting the mineralogy of this county. Slate and variegated marble, lead and copper ores have been found in Whethorn parish; slate and whin in Kirkmaiden; lead ore in Knuck bay in New Luce, but not wrought. On the West coast of Wigton parish are the standing stones of Turboise, a circle of 18 erect granite stones, 218 feet in circumference. Forty-three yards south of this is a large single stone 160 yards to east are three stones in a line from west to east, and directly north are two cairns, the nearest of which is 140 yards, and the farthest 160 yards distant from the standing stones. The circumference of the former 240, of the latter 256 feet. This must be a Druidic monument, but for what purpose erected is entirely unknown.

CONCLUDED.

[WRITTEN FOR THE JOURNAL OF MINING.]

#### THE ELECTRO-POSITIVE METALS—No. 7.

SODIUM—ITS HISTORY AND PREPARATION.

By JOSEPH HERSH, Ph. D.

The history of sodium is of but recent date and closely allied to that of potassium, with which it was discovered at the same time and in the same manner by the same genial discoverer, Humphrey Davy. All the methods mentioned for the preparation of potassium, are also applicable to the production of sodium, although some of them are more adapted to the manufacture of one metal than to that of the other. So is the production of sodium in a gun-barrel ex-

ceedingly difficult, because this metal is much less volatile than potassium, and it is due to this property, or to this want of volatility, that if sodium is produced in this manner it is obtained at once in its pure state. According to Thénard, the decomposition of the hydrate of soda is greatly facilitated by the addition of small quantities of potash. The resulting mixture of sodium and potassium is freed from the latter metal by digesting the two for a few days in an open vessel, with spirits of turpentine or petroleum. The potassium will be oxidised, while the sodium will remain behind as a silvery plastic substance. According to Brunner's method, it is produced easier than potassium, requiring a less elevated degree of temperature for its reduction and distillation. For this reduction it is not necessary to use the tartrate of soda, as the carbonate is decomposed with as much facility. It is dissolved in the smallest possible quantity of water, the solution is mixed with one-third of its weight of finely-powdered charcoal, the mixture is dried and heated to redness in a covered vessel. After cooling, the mass is mixed with one-eighth of its weight of charcoal of hazelnut size, and reduced in the same manner as potassium.

The most usual method of producing sodium on a large scale at present, is that of Deville, consisting in the treatment of soda and lime with charcoal at a very high temperature. The reduction is carried on in wrought iron cylinders set alongside of each other, although every cylinder rests in a separate furnace, the flues of the different furnaces leading into one chimney. These cylinders lying horizontally in the furnace, are closed at both ends with cast iron heads which reach out of the furnace, and which are bolted down tightly, an ordinary clay cement being interposed to render them tight before every operation. The front head of the cylinder is provided with an opening for the insertion of the condenser of receiving pipe. The cylinders are not exposed to the flame, but are protected by a brick arch. Nevertheless they are destroyed after a few distillations. The dimensions of the cylinders commonly used, are a length of 0.75 meters, the diameter being 0.10 meters. As soon as distillation commences the sodium is collected by an attendant, by means of an iron rod, as fast as it is condensed, and pushed into dishes set underneath and filled with petroleum. Those dishes stand in such close proximity to the furnace that they are kept warm, together with their contents. In this manner the sodium is kept liquid, and is cast into bars weighing 200 grammes, as soon as distillation is finished. The sodium is kept constantly under petroleum.

MARKET REVIEW.

FRIDAY EVENING.

Gold and Silver Stocks have been quite firm during the week, and many ruled at higher rates at closing to-day. Alpine, held last Friday at \$1 40, was offered to-day at \$1 60; American Flag has declined, \$1 70 was offered; Atlantic & Pacific was held at \$5 50 to-day, an advance of \$1; Ayers Mill and Mining has been active with sales at \$5 a \$5 10; Bates & Baxter quiet at last week's quotation; Benton held at \$1 50 last Friday has declined, and at closing to-day was offered at \$1 10; Dohtail, \$3; Boscobel has declined 40c. \$1 10 being offered to-day. Bullion Cou. solidated continues to decline, \$2 25 was offered to-day; Burroughs Gold, 30c.; Church Union was held at \$2 50; Crozier 50c.; Columbian has advanced, being held at \$1 75; Consolidated Colorado 15c., a decline of 5c.; Consolidated Gregory, held at closing last Friday at \$10 45, has been active during the week at \$9 00, \$9 50 a \$10 25, but to-day has declined closing with sales at \$8 75 a \$9; Corydon has advanced to \$13 15, with sales at \$3 a \$3 25; Downville 10c.; Eagle \$1; Echna, held at \$3 25; First National, \$4 25; Gold Hill, \$4; Gunnel, active with sales at \$7 a 8c.; Holman, 20 a 25c.; Hope held at \$1; Keystoue 7 a 8c.; Kipp & Buell unchanged; La Crosse has declined, 87c. was bid to-day against \$1 30 a \$1 50 last week; Liebig, 85 a \$1; Montana Gold still continued to advance, with sales at 48 a 55c.; Montana held at 85c.; New York has been quiet at lower figures; Nye sold yesterday at 9c.; Oak Hill 20c.; 45c. was offered for Ohio & Colorado to-day; Palranagat steady at last week's quotation; People's \$1 25; Quartz Hill unchanged; Quicksilver 45 1/2c.; Mariposa 12 1/2c., preferred, 31 1/2c.; \$1 was bid for Rocky Mountain yesterday, held to-day at \$2; Smith & Parmlee sold for \$6 40 a \$6 50 yesterday; Texas has declined to 5 a 6c.

Copper Stocks.—Caledonia was not offered; Davidson sold yesterday at 70c. Other Stocks are quoted as follows:

	OFFERED.	ASKED.
Canada Copper.....	10	70
Evergreen Bluff Copper.....	10	50
Hilton Copper.....	1 00	.....
Indiana Copper.....	.....	4 00

Mendota Copper..... 2 80  
Minnesota Copper..... 10 00

Lead Stocks.—Tudor Lead was held at \$2 95. Walkhill sold on Monday at \$1 24, a decline of 11c. from last week's quotation; \$1 26 was offered to-day.

Miscellaneous Stocks.—Wallace Nickel held at \$3; Long Island Peat sold at \$3 90@3 95, yesterday; Wells, Fargo & Co. Express held at 86c., 60c. bid.

Petroleum Stocks are quoted as follows:

	Offered.	Asked.
Benehoff Run.....	\$3 85	\$4 50
Buchanan Farm.....	.....	25
Central.....	1 00	1 15
Excelsior.....	20	22
Manhattan.....	.....	25
Mountain Oil.....	.....	70
New York and Newark.....	7	12
N. Y. Phil. & Baltimore.....	.....	6
Pit Hole Creek.....	75	1 00
Royal Farm.....	20	25
Shade River.....	2	10
United States.....	3 60	4 00

Coal Stocks have declined: Offered. Asked  
Cumberland preferred..... 65 1/2 66  
Butler..... 19 19 1/2  
Wilksbarre..... 63 1/2

Government Stocks are moderately firm at lower rates.

	Offered.	Asked.
U. S. 6% '81 coupons.....	112	.....
5.20's '82.....	107 1/2	.....
5.20's '83.....	106	.....
10.40's.....	99 1/2	.....
7.30's, 1st series.....	105	.....
7.30's, 2d series.....	105	.....

Foreign Exchange is dull. Bills at sixty days on London are quoted at 108 1/2@109 for commercial; 109 1/2@109 1/2 for bankers'; do. at short sight, 110@110 1/2; Paris at sixty days, 5.17 1/2@5.13 1/2; do. at short sight, 5.13 1/2@5.11 1/2; Antwerp, 5.17 1/2@5.16 1/2; Swiss, 5.17@5.15; Hamburg, 36 1/2@36 3/4; Amsterdam, 41@41 1/2; Frankfurt, 41 1/2@41 1/2; Bremen, 75 1/2@79 1/2.

Gold was 138 at 3 p. m.  
Copper.—The market is unsettled. Ingot inactive. Detroit may be quoted at 27 1/2@28 1/2c.; Portage Lake and Baltimore 29 1/2@27 1/2. Advances are looked for.

Iron.—The market is weak and unsettled. Scotch bar, \$40@ \$52; American bar refined \$102; English common, \$92. Pig has declined and may be quoted as follows. No. 1 Scotch, \$40@ \$52; No. 1 American, \$50@ \$51; No. 2 American, \$45@ \$47.

Steel unchanged.  
Tin.—Firm and in demand. Large sales to arrive, about 3,000 slabs from the Straits.

Lead.—Dull and nominal.  
Spelter.—Quiet and firm.

Salt.—The market steady at previous rates.  
Zinc.—Remains quiet and firm.

Petroleum.—Is firm but quiet. We quote crude 49@47 cr. in bulk, 14 1/2@14 1/2 cts.; do. in barrels, at 20@20 1/2c. refined in bond, 110 deg. test, light straw, 26c.; light straw to white, 27 @28c.; prime light straw to white, 29@30c.; standard white, 34@34 1/2c.; prime white, 35@36c.

Gunpowder.—Blasting (A), per keg of 25 lbs, \$5; Mining, \$5.50; Rifle, \$7.50.  
Quicksilver.—Market well supplied with but little doing.

THE COAL TRADE.

FRIDAY EVENING, Dec. 14, 1866.

Wholesale.—The market remains about the same as at last writing. The reason for business has passed, and to no one now expects a very lively trade. The past three or four months' dullness has been disastrous to the trade, and many a dealer has not made his salt. Upon reaching the new year we shall look for "better times." Many speculate what the condition of the market will be at the Spring opening—and well they may, for the oldest merchant does not pretend to solve the problem. It is our opinion that the surplus Coal over our actual wants will this season amount to about one million tons, and the present stagnation in all branches of industry may increase this estimate somewhat. The question then is, what will be the effect of having such an excess on hand? Many dealers consider the late fall in prices a disaster, but we think it will prove a great benefit, inasmuch as it will create an increased demand during the winter, and thereby reduce our surplus considerably.

At the close of the Coal season of the Lehigh Valley Railroad on the 30th November, the figures stood thus:

1866.....	1,730,474 tons.
1865.....	1,402,276 "
Increase 1866.....	328,198 "

The season of the Lehigh Coal and Navigation Company closed on Wednesday, December 5. Total tons carried in

1866.....	1,066,207 tons.
1865.....	888,781 "
Increase 1866.....	177,523 "
Total increase of Lehigh Valley.....	505,721 "

The season of the Philadelphia and Reading Railroad also closed on the 30th November. The total number of tons transported over the Schuylkill branch was, in

1866.....	3,425,330 tons.
1865.....	2,802,362 "
Increase 1866.....	622,937 "

Retail.—The past few days of genuine winter weather has caused a general activity among dealers. The low price of Coal has brought many new buyers into the market. There is consequently a better general feeling. The Pittston Company have again reduced their prices to \$6 50 for Egg and Stove, and \$5 for Nut, causing some excitement.

Foreign.—There being but a small stock on hand prices rule firm, and there is but little activity. We quote the following sales: 100 tons English Gas Canal, \$16 25 per ton, 2,249 lbs.; 50

tons English House Canal, \$17 50, ex ship; 100 tons Liverpool Gas Coal, ex ship, \$11; 75 tons Despard Gas Coal, \$10, 2,240 lbs.

Provincial.—We quote sales of 400 tons at \$8 75@9.

Lehigh Coal Trade, for Week Ending Saturday

December 8.

OPERATORS.	RAILROADS.		CANAL.	
	Week.	Total.	Week.	Total.
Ashburton Coal Company.....	.....	.....	.....	163
Audenreid.....	.....	.....	.....	13,527
Baltimore Coal Company.....	548	548	.....	13,195
Buck Mountain.....	297	477	.....	24,485
Central Coal Company.....	49	49	.....	25,572
Coleman.....	.....	.....	.....	.....
Council Ridge.....	1,104	1,467	.....	7,266
Coxe Bro. & Co.....	.....	.....	.....	.....
Comery, John.....	24	24	.....	.....
Coal Run Coal Company.....	.....	.....	.....	.....
Delano.....	.....	.....	151	5,305
East Sugar Loaf.....	36	484	.....	.....
Eberly's Coal Company.....	346	643	.....	27,758
Franklin Coal Company.....	32	32	.....	12,552
Ger Pa Coal Company.....	.....	128	.....	25,282
Glendon Coal Company.....	.....	.....	.....	6,784
Germania Company.....	140	140	.....	10,715
Hazleton.....	259	259	.....	76,483
Harleigh.....	95	228	.....	16,729
Highland Coal Company.....	.....	.....	.....	.....
Honey Brook Coal Company.....	906	1,043	.....	32,327
Hull & Co., Thomas.....	.....	.....	.....	14,270
Jeddo (G. B. M. & Co.).....	882	1,143	.....	55,597
Kuickerbocker.....	21	46	.....	9,706
Laubach, J. & Co.....	.....	.....	.....	1,475
Lehigh Zinc Company.....	.....	.....	.....	.....
Lehigh & Susquehanna.....	.....	.....	.....	11,842
Lehigh Coal & Navigation Co.....	.....	.....	.....	599,619
Mahanoey.....	.....	.....	.....	.....
Mount Pleasant.....	.....	.....	.....	.....
Meadow, B. (D. W.).....	.....	.....	.....	6,475
McNeal Company.....	49	146	.....	21,270
Moyers, H.....	.....	.....	.....	.....
Mount Etna Coal Company.....	58	58	.....	4,327
New Boston C. Co.....	.....	.....	.....	.....
New Port C. Co.....	.....	.....	.....	1,524
New York & Lehigh.....	.....	.....	.....	.....
New Jersey.....	214	214	.....	5,301
North Mahanoey.....	.....	.....	.....	8,585
Packer, Skeer & Co.....	.....	85	.....	84,303
Patterson, W. T.....	.....	.....	.....	.....
Parish & Thomas.....	496	496	.....	405
Primrose Coal.....	.....	.....	.....	1,542
Rathburn, Stearns & Co.....	.....	169	.....	.....
Reber, J. B. & Co.....	.....	.....	.....	.....
Sharpe, Weiss & Co.....	.....	.....	.....	29,804
Stout Coal Company.....	168	217	.....	18,821
Spring Mountain.....	449	449	84	6,353
Silliman.....	1,867	1,934	.....	.....
Shamokin Coal Company.....	.....	.....	.....	.....
Thomas Coal Co.....	39	39	.....	3,085
Trenton Coal Company.....	10	10	.....	379
Union.....	72	72	.....	3,962
Wilkesbarre.....	228	228	.....	45,686
Woodside Company.....	.....	.....	.....	.....
Warrior Run.....	53	53	.....	6,310
Wyoming.....	165	165	.....	1,552
Walter Bro. & Co.....	.....	.....	.....	12,750
Other shippers.....	61	61	.....	13,495
Total.....	9,727	12,197	169	1,066,307
Corresponding week last year.....	26,629	33,360	9,225	888,784
Increase.....	.....	.....	.....	177,523
Decrease.....	16,902	21,162	9,056	.....

Lehigh and Mahanoey Coal Trade, 1866.

For week ending December 8th, 1866.

NAMES OF SHIPPERS.	WEEK.		TOTAL.
	1866.	1865.	
Trenton Coal Co.....	39 19	30 19	30 19
Mount Etna.....	43 04	43 04	43 04
Mahanoey Coal Co.....	.....	.....	.....
Delano Colliery.....	.....	.....	156 09
Glendon Coal Co.....	.....	.....	.....
Rathburn, Stearns & Co.....	.....	.....	.....
E. S. Silliman.....	1,987 15	.....	2,278 06
McNeal Coal & Iron Co.....	.....	.....	98 10
Kuickerbocker Coal Co.....	21 17	46 14	46 14
Thomas Coal Co.....	90 03	90 03	90 03
Williams & Nerring.....	.....	.....	69 08
Other shippers.....	10 02	69 08	69 08
Total.....	2,184 00	2,963 06	2,963 06
Corresponding week last year.....	1,508 1	3,377 00	3,377 00
Increase.....	.....	675 03	.....
Decrease.....	.....	.....	388 14

Cumberland Coal Trade.

By Railroad.

Statement of Coal shipments over the Baltimore and Ohio Railroad for the week ending Dec. 15th:

	Tons.
From Eckhart R. R.....	325 08
Blaeu-Avon Company.....	305 01
Spruce Hill.....	.....
From Cumberland and Pa. R. R.....	1,398 16
Consolidation Company.....	1,269 09
Borden Mining do.....	1,349 11
American do.....	55 17
Clifton do.....	45 06
New Hope do.....	.....
.....	4,647 19
From George's Creek via Piedmont.....	.....
George's Creek Coal and Iron Company.....	2,889 12
Central do.....	11 04
Atlantic do.....	329 08
Piedmont do.....	745 09
Swanton do.....	961 04
Barton do.....	920 09
Potomac do.....	1,275 02
George's Creek Mining Co.....	316 18
Franklin do.....	1,639 02
Hampshire do.....	2,019 14
.....	2,615 18
Total.....	13,773 18
Transportation since 1st of January.....	Tons. Cwt.
From Companies by Eckhart R. R.....	46 694 06
From do by C. & P. R. R.....	131,830 04
From do via Piedmont.....	559,890 08
From West of Piedmont, Gas Coal.....	52,210 00
Total.....	781,624 18

By Canal For the week ending with Saturday, Dec. 8th, and for the season: Companies, Boats, Tons. For Week, For Season.

Reports of the Coal Traffic for the Last Week as compared with those of the corresponding week last year, are as follows:

Table comparing coal traffic for 1865 and 1866. Columns include Week, Total, Inc & Dec.

Schuylkill Coal Trade by Railroad and Canal.

Table showing coal trade by railroad and canal for the week ending Tuesday, December 3, 1866.

Prices of Coal by the Cargo.

Table listing prices for various coal types at New York, Dec 15, 1866, and at Philadelphia, Dec 15, 1866.

Prices for Pittston Coal at New York, Dec. 15, 1866.

Table listing prices for Pittston coal at New York, Dec 15, 1866.

Lehigh Coal at Elizabethport, Dec. 15, 1866.

Table listing prices for Lehigh coal at Elizabethport, Dec 15, 1866.

George's Creek and Cumberland Coal.

Table listing prices for George's Creek and Cumberland coal.

At Baltimore, Dec. 15, 1866.

Table listing prices for coal at Baltimore, Dec 15, 1866.

At San Francisco.

Table listing prices for coal at San Francisco.

Table listing prices for foreign coals from various ports like Liverpool, West Hartly, etc.

Prices of Foreign Coals.

BY H. L. PARMELE & BRO., 32 Pine street, N. Y. Duty \$1.25 per ton.

Prices of Provincial Coals.

BY LOUIS J. BELLOM, JR., 43 Pine street, N. Y. Duty \$1.25 per ton.

Table listing prices for provincial coals from various regions.

Coal Freights.

Table listing coal freights by railroad and by Morris Canal.

Freights on Coal to Elizabethport.

Table listing freight rates for coal to Elizabethport.

Expenses from Mauch Chunk to Jersey City for Re-shipment.

Table listing expenses for re-shipment of coal from Mauch Chunk.

From Baltimore.

Table listing prices for coal from Baltimore.

From Georgetown or Alexandria.

Table listing prices for coal from Georgetown or Alexandria.

From Port Richmond, Philadelphia.

Large table listing prices for coal from various ports including Port Richmond, Philadelphia, and others.

From Elizabethport.

Table listing prices for coal from Elizabethport.

Provincial Freights.

Table listing provincial freight rates.

Foreign Freights.

Table listing foreign freight rates.

WEEKLY COAL TRADE CIRCULAR.

New York, Dec. 11, 1866. The cold weather through the week just closed has placed a complete embargo upon canal navigation, and the shipping season of 1866 may be said, therefore, to be finally ended.

The cold weather through the week just closed has placed a complete embargo upon canal navigation, and the shipping season of 1866 may be said, therefore, to be finally ended. The quotations for coal remain unchanged. All choice brands of coal have been bought up by dealers at retail, who are now doing a fair water business.

COPPER ORES.

Table listing prices for copper ores at New York, Dec 12, 1866.

Market inactive Demand for refined copper inconsiderable.

Table listing prices for copper ores at Baltimore, Dec 11, 1866.

The supply of ores is inadequate to the consumption just now and prices may go yet lower unless the Tariff is changed so as to admit South American and Canada ores for free of duty.

BOSTON STOCK MARKET.

Boston, Dec. 13, 1866. The market has been steadily improving for the last week. Mass. and Oil are strong at 100; Crescent Petroleum is still held steady at 7 1/2; Indian Spring has been sold at 12 1/2; Pepper Well Petroleum has declined, having touched as low as 50c; Gilberton Coal remains steady at \$20 bid, 23c asked; Harleigh Coal has been sold at \$9, it is now offered at \$15; Lackawanna is quite strong at \$3 25 bid, and \$6 00 asked; Mammoth Vein is offered for \$2 10; Short Mountain is strong at \$15 50 bid.

FOREIGN METAL REVIEW.

There is a decided falling off in the demand for Metals, and prices have a downward tendency; cheap money seems to be without influence, and there are but poor prospects of a speedy improvement. Irons.—The Welsh iron trade is steady, still makers would make a slight concession for orders of importance. The reports from Staffordshire are of a dull character, and prices somewhat carrier. Scotch pig iron has reduced to \$32.61, cash. Copper.—A dull and unsatisfactory market; sales cannot be effected unless at ruinous prices, and quotations for English as well as Foreign Copper are quite nominal. Tin is easier to buy; the last transaction for Straits have been at \$21, and good merchantable at \$20 cash, while for Banca \$22 and \$21 1/2 has been accepted. English Tin rather firmer. The Dutch market is firm at 47 1/2. TIN PLATES.—Market very dull, and buyers holding off. LEAD.—A firm market, with a good home demand. SPECTER.—After a few small sales at \$20 1/2 to \$21, spot, the price has recovered to \$21 7/8 to \$22, at which there are now buyers; \$21 1/2 paid for January. Special parcels in outputs, \$21 7/8, 6d. to \$21 1/2.

Oil Trade Circular.

The trade has somewhat improved, and quotations for future contract have an upward tendency; sales having been effected at an advance of 1d. since our last report. REFINED PETROLEUM.—Firm at 18 7/8 to 18 3/4, per gallon in London; Liverpool, 18 7/8. CRUDE.—16 to 18, 31, per gallon. SPIRIT.—7d. to 18, 31, per gallon. REFINED COAL OIL.—18, 6d. per gallon. PARAFFIN WAX.—3d. to 18, per lb.

SAN FRANCISCO STOCK MARKET.

Table listing stock market prices at San Francisco, Dec 13.

NEW YORK METAL MARKET.

Table listing various metals and their prices, including Copper, Iron, Steel, Lead, Tin, and Zinc, with sub-categories like 'COPPER-Detroit', 'IRON-Pig', and 'STEEL-English'.

60,181.—DEVICE FOR GRINDING METAL PLATES.—Thos. Hanby, Decatur, Ill. I claim, 1st, The combination of the carriage, E, carriage, G, ways, D, screw, F, clamp, H, and bars, c, t, arranged and operating in the manner and for the purpose herein specified.

Special Scientific Brevities.

At a recent meeting of the Quekett Microscopical Club, a paper was read, says the London Review, by Mr. R. T. Lewis, detailing the result of microscopic observations on the perforations made by the passage of the electric spark in various kinds of paper, cards, the leaves of plants, mica, thin glass, the film of eggs, etc.

M. Pierre says some people have supposed that corn becomes laid because of the weakness of the stalk from the absence of silica, but chemical analysis does not show a deficiency of silica.

Mr. G. Plante, in a note to the French Academy, states that fifty per cent. more ozone is produced in the electrolysis of water, when the poles are of lead, than when they are made of platinum.

In a life of fifty years a man makes upwards of 500,000,000 of respirations, and drawing through his lungs nearly 170 tons weight of air, and discharging nearly 20 tons weight of carbonic acid.

Fulton launched the first steamboat in 1807. Now there are over three thousand steamboats traversing the waters of America.

In 1800 it took weeks to convey intelligence between Philadelphia and New Orleans; now it can be done in as many minutes by the electric telegraph, which only had its beginning in 1843.

In France sugar has been lately separated from beet molasses by applying the osmose principle. The membrane used is paper-parchment. Water is passed upward and molasses downward on opposite sides of the membrane.

Hesse has discovered a new alkaloid in the red poppy; it is also found in good opium. It is soluble in water, alcohol, and ether, and crystallizes from the last in white prisms.

Mineral and other On-dits.

On the farm of David Graham, Esq., near Max's Meadows, in Wythe county, Virginia, has recently been discovered a mine of yellow oxide of zinc.

The tunnel under the Alps has reached 7,415 feet in length on the French side, and 11,285 on the Italian. At the present rate of progress, five years will be required to complete the work.

It has been found that the copper-bearing series in Canada extends over a surface of 2,600 square miles, and that nearly an equal area of country possesses copper near Lake Superior.

The Detroit papers mention the discovery of a bed of hydraulic limestone in Alpena county, Michigan, which, if of the quality believed, will be a mine of wealth to those engaging in the making of cement.

In pumping out an old marble quarry in Rutland, Vt., recently, when had neither outlet or inlet, several large speckled trout were taken out, one of which weighed two and a half pounds.

United States Assay Office,

No. 30 Wall Street, NEW YORK CITY.

Gold and Silver Bullion, Jewelry, Foreign Coins, etc., received on deposit in amounts not less than \$100 in value, and returns made, as soon as assayed, in coin or fine bars, at the option of the depositor, and on the same conditions as the U. S. Mint.

Bullion sent through the agency of Express Companies should be accompanied by explicit instructions as to return of proceeds.

GEORGE F. DUNNING, SUPERINTENDENT. ALFRED P. ROCKWELL, (Professor of Mining in Yale College.) CONSULTING MINING ENGINEER.

Address, NEW HAVEN, Connecticut.

NITRO-GLYCERIN. United States Blasting Oil Company.

We are now prepared to fill all orders for Nitro-Glycerin, and respectfully invite the attention of Contractors, Miners, and Quarrymen to the immense economy in the use of the same.

Address Orders to JAMES DEVEAU, Sec'y., 12-2:3p 32 Pine street, N. Y.

SPECIAL HOLIDAY CIRCULAR.

HOLIDAY BOOKS For the Young Folks.

Published by JAMES O'KANE, No. 125 NASSAU STREET, NEW YORK.

HANS BRINKER; THE SILVER SKATES, A STORY OF LIFE IN HOLLAND. By MARY E. DODGE, author of the Irvington Stories.

The Irvington Stories. Superbly illustrated by F. O. C. DARLEY and THOMAS NAST. 1 vol., 317 pp., richly bound in cloth, bevelled boards. Price \$2.

The Boys of the Bible. By HENRY L. WILLIAMS, Jr. Elegantly illustrated. 1 vol., bound in handsome cloth, bevelled boards. \$1 50.

The Girls of the Bible. By Rev. P. C. HEADLEY. Superbly illustrated. 1 vol., elegantly bound in cloth, bevelled boards. \$1 50.

A most extensive and carefully-selected stock of American and English Illustrated Books will be found at the store of the subscriber.

ARION PIANOFORTE.—PATENTED. Pre-eminently the best Piano ever constructed, unrivalled for tone, durability and elegance of finish.

Is for sale at the Manufactory and Warerooms, 187 and 189 Bowery, second door above Delancey street.

MANNER & CO. N. B.—We have a number of Second Hand Pianos to sell or rent. 12-2:2

PASSAIC MACHINE WORKS, Corner of Passaic & Ogden St., near Passaic River.

Fourth Block North of the Morris & Essex Railroad Depot, NEWARK, N. J. MANUFACTURES Steam Engines, Boilers, Sugar Mills, Saw and Grist Mills, Embossing Machines, Calenders, Gearing, Pulleys, Hangers and Slating, Cast and Wrought Iron Pipe and Fittings, for Steam and Water, Power, Drop & Foot Presses, Machinists' Tools of all kinds Wm Watts' Patent Steam Pump. Iron and Brass Castings Made to Order. Jobbing Promptly Attended to. Terms Easy, and all Work Warranted.

Birmingham Iron Foundry, MANUFACTURERS OF CHILLED ROLLS, Iron & Composition Castings of Every Description, Mill Gearing, Trip Hammers, Shafting, Shears, Presses, etc

India Rubber Calenders, Grinding and Cutting Machines, IRON, STEEL, BRASS AND COPPER ROLLING MILL MACHINERY, FITTED UP COMPLETE.

ROYAL M. BASSETT, President. THEODORE S. BASSETT, Sec'y. Birmingham, Ct. 11-2:3p

WILLARD & MILLWARD, DEALERS IN NEW AND SECOND-HAND STEAM ENGINES, MACHINERY, &c., No. 234 WATER STREET, NEW YORK.

Also, Sole Agents for the Sale of the DAVIS PATENT DUPLEX SUPER-HEATING BOILER. vol2:12:3p

Patent Claims.

Interesting to Miners, Millmen, Metallurgists, Oil-Men and Others.

The following claims have recently been issued from the United States Patent Office:

60,081.—GOVERNOR FOR STEAM ENGINES.—Francis Taggart, Brooklyn, N. Y. I claim a regulator for engines, fitted substantially in the manner specified, so that the pressure from the boiler shall act in the opposite direction to the pressure from the engine, and the difference of pressure produce a movement to regulate the supply of steam, substantially as set forth.

60,089.—TABLE FOR CONCENTRATING ORES.—Henry Alderson Thompson, Grant, Gipps Land, Victoria. I claim the combination of the frame, A, supports, N, and screws, B, with the table, R, stirrer, Q, and stirrer-frame, O, substantially as and for the purposes herein shown and described.

60,090.—MACHINE FOR MAKING CRUCIBLES.—Samuel R. Thompson, Portsmouth, N. H. I claim, 1st, The combination of the cylinder, B, piston head, D, screw piston rod, E, bevel gear wheels, F and G, shaft, H, and crank wheel, J, with each other, and with the frame, A, of the machine, substantially as herein described, and for the purpose set forth.

2d, The combination of the case, K, core, L, and cover, M, with each other, when said parts are constructed and arranged substantially as herein described, and for the purpose set forth.

3d, The combination of the swinging guide bar, R, the swinging binding bar, T, and the binding and centering screw, U, with each other, with the cover, M, and with the parts, O and P, substantially as described, and for the purpose set forth.

4th, The combination of the bow, V, wire, W, and guide rod, X, with each other, and with the cylinders, B and K, substantially as herein described, and for the purpose set forth.

60,120.—APPARATUS FOR THE MANUFACTURE OF "SALT-BLOCK."—Newell Barnard and J. G. Spiller, Saginaw City, Mich. I claim, 1st, Admitting the brine at the forward end or hottest part of the block, B, substantially as described and for the purpose set forth.

2d, Drawing off the bitter water at the rear end of the block, D, substantially as described and for the purpose set forth.

3d, The combination with the lower vat, C, with the block, D, and with the drying rack, B, of the trough, A, substantially as described and for the purpose set forth.

60,134.—FURNACE FOR DESULPHURIZING ORES.—William Brickner, San Francisco, Cal. I claim the internal screw ribs or ridges arranged spirally in opposite directions so as to convey the ore alternately from end to end of the cylinder and heat it uniformly.

60,145.—CENTRIFUGAL PUMP.—E. Hall Covel, New York City. I claim in pumps the combination of a water-wheel and screw-elevator, when arranged substantially as and for the purpose described.

I also claim an angular or irregularly shaped chamber in combination with a pump-cylinder in which water or other fluid is elevated by a spiral or vertical motion, substantially as described and for the purpose specified.

60,146.—FORCE PUMP.—W. G. Crutchfield, assignor to himself and James O. Ottie, Dayton, Ohio. I claim the arrangement with the stem, A, of a force-pump of the pipe, C, with its cock and cap, substantially as and for the purpose described.

60,154.—ORE CRUSHER.—M. B. Dodge, New York City. I claim the application of soft wrought-iron faces to the jaws of a quartz-crusher, substantially as and for the purpose described.



**E. A. PACKER & CO., MINERS,**  
SUGAR LOAF AND ROOM RUN  
**LEHIGH COAL.**  
OFFICE.  
50 TRINITY BUILDING,  
111 Broadway,  
NEW YORK

**CHARLES SILVER, WHOLESALE DEALER IN**  
**COAL.**  
Office, 19 Trinity Building,  
111 Broadway, New York.  
SOLE AGENT FOR  
Buck Ridge, Shamokin, and Manchester Red Ash Coals.

**AECHTERNACHT & CO.,**  
113 Broadway,  
NEW YORK.  
H. A. AECHTERNACHT,  
H. W. BENTONALL,  
AGENTS FOR ALSO SHIPPERS OF  
Preston Coal and Imp't Co.'s Wilkesbarre, Lehigh,  
and Shamokin,  
Geo. J. Dovey, Son & Co's Cumberland and  
Locust Mountain and Red Ash Broad Top.  
27-11 COAL BY THE CARGO.

**HECKSCHER & MASON**  
NO. 71 BROADWAY,  
Room 31 New York,  
Offer for sale the following Coals at the lowest market rates:  
GLENDON COAL COMPANY'S  
BUCK RIDGE, SHAMOKIN,  
BLACK DIAMOND VEIN, RED ASH,  
LOCUST MOUNTAIN, WHITE ASH.  
Also their own importation of  
INCE HALL HAND PRESSED CANNEL,  
In lots to suit purchasers. vol:2-5-1f

**LOUIS AUDENRIED & CO.,**  
Miners and Shippers of the following  
**CELEBRATED ANTHRACITE COALS,**  
FROM PHILADELPHIA AND THE MINES.  
Diamond ..... Red Ash ..... Locust Mountain ..... White Ash.  
Spohn ..... " ..... Black Heath ..... " .....  
Orchard ..... " ..... Spring Mountain ..... Lehigh.  
Broad Mountain ..... White " ..... Wilkesbarre.  
FROM ELIZABETHTOWN AND JERSEY CITY.  
Also, the superior CUMBERLAND COALS.  
Lehigh, Hazleton, Council Ridge and Wilkesbarre Coals.  
Broad Top. Barton. Barton.  
Semi-Bituminous. Georges' Creek. Georges' Creek.  
at Philadelphia. at Baltimore. at Alexandria.  
25 Walnut street, PHILA. 14 Kirby street, BOSTON.  
30 Westminster street, BROW. 24 Second street, BALTIMORE.  
27-1f 110 BROADWAY, NEW YORK.

**JOHN WHITE, SHIPPER OF**  
**WILKESBARRE COAL,**  
FOR STEAM AND FAMILY USE.  
OFFICE.  
27-3 Room 21, No. 8 Wall street, N. Y.

**COAL.**  
**AMERICAN AND FOREIGN, BITUMINOUS AND**  
**ANTHRACITE,**  
FOR  
MANUFACTURES, STEAMERS, EXPORT, GAS  
AND  
DOMESTIC PURPOSES.  
**W. Seward & Co.,**  
65 TRINITY BUILDING,  
111 BROADWAY  
27-1

**DESULPHURIZING PROCESS.**  
Patented by B. Keith, A. Behr and N. S. Keith,  
SEPTEMBER 9th, 1902.  
Parties desirous of procuring the right to use the process, and  
INFORMATION OF THE LATEST AND MOST IMPROVED MA-  
CHINERY FOR REDUCING ORE.  
Can apply to B. KEITH, 41 Liberty Street, New York,  
Or to  
24 ps A. BEHR & N. S. KEITH, Black Hawk, Colorado.

THE  
**BISHOP GUTTA PERCHA CO.**  
The Original and Only Manufacturers in the United States of  
**PURE GUTTA PERCHA GOODS,**  
Gutta Percha Insulated Submarine Telegraph Cables,  
Insulated Wire for Telegraph, Mining and Blasting  
Use.  
WATER, BEER, AND SODA PIPE; CHEMICAL VESSELS, TISSUE  
SHEET FOR HATTERS, ARTIFICIAL FLOWER MAKERS, &c.  
Factory, Nos. 208, 210 and 212 East 25th Street.  
**Office and Salesroom, 113 Liberty street,**  
**New York.**  
West of Broadway.

WALTER O. LEWIS, Esq., SAMUEL C. HISHOP,  
25-ps Electrician to the Co General Agent.

**GROVETSTEEN & CO.,**  
**PIANO-FORTE MANUFACTURERS,**  
499 BROADWAY, NEW YORK.  
These Pianos received the Highest Reward of Merit at the  
World's Fair, over the best makers from London, Paris, Germany,  
the cities of New York, Philadelphia, Baltimore and Boston; also,  
the GOLD MEDAL at the American Institute for FIVE SIXTEEN-  
SIX YEARS! Our Pianos contain the French Grand Action,  
Harp Pedal, Overstrung Bass, Full Iron Frame, and all Modern  
Improvements. Every Instrument WARRANTED FIVE YEARS.  
Made under the supervision of Mr. J. H. GROVETSTEEN, who has  
a practical experience of over thirty-five years, and is the maker  
of over eleven thousand pianofortes. Our facilities for manufac-  
turing enable us to sell these instruments from \$100 to \$200  
cheaper than any first-class piano-forte. 19-9p

**FAMILY KNITTING MACHINES**  
FOR HOSIERY AND FANCY ARTICLES.  
Manufactured by the  
**Dalton Knitting Maching Company.**  
OFFICE No. 669 BROADWAY, N. Y.  
WM. JAS. BOGGS, Secretary. D. P. RHODES, Pres.  
For Agencies and Circulars, apply as above. 25km

**EMPIRE SEWING MACHINE CO.**  
Principal Office, 616 Broadway, N. Y.  
GREAT IMPROVEMENT  
in Sewing Machines. Empire Shuttle, Crank Motion Sewing Ma-  
chines. It is thus rendered noiseless in action. Its motion  
being all positive, it is not liable to get out of order.  
**IT IS THE BEST FAMILY MACHINE.**  
Notice is called to our NEW and IMPROVED Manufacturing Ma-  
chine for Tailors and Boot and Shoe Fitters.  
Agents wanted, to whom a liberal discount will be given. No  
consignments made.  
EMPIRE SEWING MACHINE CO.  
6 qp 616 Broadway, N. Y.

**A DECIDED IMPROVEMENT.**

The Dial **CANCEL-  
LING STAMP,**  
Self-inking. Self-adjusting,  
for days and months. Sim-  
ple, durable and reliable.  
Only one form of die is used,  
as per sample (oval shape).  
I also furnish at the Man-  
ufacturers' prices, every var-  
iety of Hand Stamps and  
Seal Presses manufactured  
in the United States. JAMES  
DAMMERS, 195 Broadway,  
New York. 18-xm

**J. CLAYTON'S**  
**Patent Steam Pumps,**  
**HAND PUMP, & STEAM ENGINE COMBINED.**  
These pumps contain every desirable quality in a steam pump,  
are made of the best material, and in the best manner, and are  
the cheapest first-class pumps in the market. For cut and de-  
scription see JOURNAL OF MINING, No. 18, Vol. I. Please send for  
circular.  
PRICE LIST.

No.	Diameter of Steam Cyl- inder.	Diameter of Water Cyl- inder.	No. Revolu- tions.	No. Gallons discharged per minute.	Length of Stroke.	PRICE.
No. 0	2 1/2 in.	1 1/2 in.	200	4	4	\$150 00
" 1	4 "	2 "	180	20	5	200 00
" 2	5 "	2 1/2 "	160	45	6	275 00
" 3	7 "	3 1/2 "	140	85	7	375 00
" 4	9 "	5 "	110	150	8	525 00
" 5	12 "	7 "	90	275	8	625 00

Other sizes of pumps made to order at the shortest notice.  
18ps JAMES CLAYTON, 102 Front street, Brooklyn, N. Y.

**CARD.**—Professor H. DUSSAUC, Chemist, lately  
from the Laboratory of the French Government, has  
resided in Europe several months. He takes occasion to inform  
his numerous friends that he has returned and is ready to give  
all necessary information on chemical processes, fabrications, etc.,  
etc. Address, New Lebanon, Columbia County, N. Y.

**CONSOLIDATED LINE.**  
**Great Through Route**  
TO  
**THE MINING REGION**  
AND  
**THE PACIFIC STATES.**  
**The Holladay Overland Mail**  
AND  
**EXPRESS COMPANY.**  
having consolidated the property of the "OVERLAND STAGE  
LINE" and the "OVERLAND BUS-PATCH COMPANY"—comprising  
all the Overland stage lines running west from the Missouri river  
—and largely increased and improved their stock and coaches  
and reduced their rate of fares nearly 25 per cent, will run a  
**Daily Line of Coaches**  
to all the principal points in the gold mines of Colorado, Uta  
Montana, Idaho, Nevada, California and Oregon.  
They are now running daily coaches from TOPEKA, (in connec-  
tion with the railroad from St. Louis,) via the "Smoky Hill"  
route; and from ATCHISON, Kansas, (in connection with the Han-  
nibal and St. Joseph Railroad) and from NEBRASKA CITY and  
OMAHA, via DENVER CITY, Colorado, to SALT LAKE CITY, in  
Utah; thence connecting with their line of coaches for Virginia  
City and Helena, in Montana; Boise City in Idaho; Walla-Walla  
Dallas City and Portland, Oregon.  
At Denver City, Colorado, connecting with their double daily  
line of coaches for Central City, Blackhawk and Empire City.  
Passengers for New Mexico and Arizona also connect at Denver,  
with a tri-weekly line of coaches for Fort Union, Taos, Santa Fe  
and other points in those territories.  
Passengers for Nevada and California connect at Salt Lake City  
with daily coaches for Austin, Reese River, Virginia City, Nevada  
Humboldt and San Francisco, California.  
This Company will also, at an early day, run a line of stages  
from Salt Lake City through the silver mining district of the Pa-  
rahmett Valley to Colville, at the head of navigation on the Col-  
orado River.

**RATES OF FARE:**  
Between Topeka, Atchison, Nebraska City, Omaha, } and Denver.....\$12  
Between same points and Salt Lake City ..... 250  
Between Denver and Salt Lake City ..... 150  
Between Salt Lake City and Boise ..... 125  
Between Salt Lake City and Virginia City ..... 125  
Through tickets from the Missouri River to Boise and Virginia  
City ..... 350  
**TIME:**  
To Denver City 5 days,  
To Salt Lake City 7 days,  
To Boise 12 1/2 days,  
To Virginia City 13 days,  
To San Francisco 15 days.  
A through and freight express, carried on mail time, in the  
of trustworthy and competent messengers, to all of the abo-  
mentioned points.  
For further information,  
Apply at the office of the Company,  
No. 25 William street, corner of Exchange place,  
New York  
BEN. HOLLADAY, President.  
W. S. GURNEE, Vice President.  
WM. H. FOGG,  
EUGENE KELLY,  
S. L. M. BARLOW,  
GEO. H. CRK, Treasurer.  
GEO. K. OTIS, Secretary.

**PORTABLE STEAM ENGINES.**  
**Brayton's Safety Steam Generator and**  
**Engine.**  
A PERFECT SUCCESS.  
By this invention the long sought for object has been accom-  
plished, to wit: A means by which steam can be generated safely,  
so that there shall be no more danger from explosion than with  
the hot-air engine, and at the same time retain all the power of  
the steam engine. This much sought for result has at last been  
accomplished, and after many severe tests we feel fully warranted  
in offering this Steam Generator and Engine to the public as a  
perfectly safe power, and at the same time a cheap power. As a  
generator of steam for heating buildings, etc., there is not its equal  
in use.  
For further information, or circular, address  
R. A. HUTCHINSON, Agent.  
21ps No. 8 Dey Street, New York.

**W. D. ANDREWS & BRO.,**  
414 WATER STREET, NEW YORK,  
Manufacturers of Andrews' Patent  
**Oscillating Engines,**  
**CENTRIFUGAL PUMPS, AND TUBULAR**  
**BOILERS.**  
Our ENGINES occupy little room, are light, simple, cheap, and  
economical, require no special foundation or balance wheel pit,  
and can be run from 150 to 500 revolutions per minute with  
safety. Sizes from 1-2 Horse to 250 Horse-Power.  
Our CENTRIFUGAL PUMPS pass mud, sand, coal, cern, gravel,  
etc., without injury, and use little power. Sizes from 90 Gallons  
to 40,000 Gallons per minute capacity. For sewers, canals, cof-  
fer dams, condensers, irrigation, and wrecking, they are un-  
equalled.  
Our BOILERS are light, strong, and portable, are economical  
of fuel, burn Wood, Hard or Soft Coal, and consume the smoke.  
Sizes from 2 to 50 Horse-Power.  
Awarded First Premiums at the recent Fair of the American In-  
stitute—a gold medal to each.  
Portables from 2 to 20 Horse-Power. Send for descriptive  
pamphlets and price-lists. 23-a

**FIRE-PROOF**  
**IRON TANK**  
**STORAGE COMPANY,**  
**TRANSFER OFFICE, - - - 11 BROAD STREET**  
14-9p NEW YORK

**IRON PAINT.**  
THE PUREST AND  
Best Mineral Paint in the Market.

**HUDSON RIVER METALLIC PAINT,**  
Brown Oxide, Orange Yellow, Black Metallic,  
Suitable for all kinds of in and out door work in any climate.  
WILL NOT BLISTER, CRACK NOR SCALE.

For sale in quantities from 100 to 300 pounds, or by the ton, by  
the sole agents,  
**L. G. TILLOTSON & CO.,**  
Manufacturers and dealers in  
**RAILWAY AND TELEGRAPH SUPPLIES,**  
26 DEY STREET, NEW YORK.  
Sole Agents for the celebrated LUBRICATIVE STEAM ENGINE  
PACKING. vol:2:3xm

**SCHOOL OF MINES, COLUMBIA COLLEGE,**  
EAST 49th STREET, NEW YORK.

FACULTY:  
F. A. P. BARNARD, S.T.D., LL.D., President.  
T. EGGLESTON, Jr., E. M., Mineralogy and Metallurgy.  
FRANCIS L. VINTON, E. M., Mining Engineering.  
C. F. CHANDLER, Ph. D., Analytical and Applied Chemistry  
and Geology.  
JOHN TORRY, M.D., LL.D., Botany.  
CHARLES A. JOY, Ph. D., General Chemistry.  
WILLIAM G. PECK, LL.D., Mining Surveying.  
JOHN H. VAN AMRINGE, A.M., Mathematics.  
OGDEN X. ROOD, A.M., Mechanics and Physics.

The plan of this School embraces a three years' course for the  
degree of ENGINEER OF MINES, or BACHELOR OF PHILOSOPHY.  
For admission, candidates for a degree must pass an examination  
in Arithmetic, Algebra, Geometry and Plain Trigonometry.  
Persons not candidates for degrees are admitted without examination,  
and may pursue any or all of the subjects taught. The next  
session begins October 1, 1886. The examination for admission  
will be held on June 25, 26, and September 23, 25. For further  
information, and for catalogues, apply to  
3vol 1-4p Dr. C. F. CHANDLER, Dean of the Faculty.

**OFFICE OF**  
**MAYNARD & TIEMANN,**  
Mining Engineers and Consulting Chemists,  
249 PEARL ST., N. Y., AND CENTRAL CITY, COLORADO.

Assays of Gold and Silver, Analyses of Ores, Minerals, Furnace  
products, Guano, Soda Ash, &c., &c.  
Special attention given to the Analysis of Iron Ores, Iron Slag  
and Iron Cinder. 17xm

**WATER-PROOF SAFETY FUSE.**  
Warranted Sure Fire  
if not Cut in Tamping.

MANUFACTURED BY  
**UREN, DUNSTONE & BLIGHT,**  
EAGLE RIVER, KEWENAW CO., (L. S.) MICHIGAN.  
MINERS TRY IT! All we ask is A FAIR FIELD AND NO FAVOR. 10-4p

**MARVIN'S PATENT**  
**ALUM AND DRY PLASTER**  
FIRE AND BURLGAR PROOF  
**SAFES.**  
WARRANTED THE BEST IN THE WORLD.

BANKERS' STEEL BURGLAR PROOF CHEST, WITH  
**MARVIN'S PATENT**  
**Combination Bank Lock.**

Alum and Dry Plaster Filling never corrodes the Iron or molds  
the Books and Papers.

THESE ARE THE  
**Only Safes Filled with this Composition.**

Please send for an Illustrated Catalogue. 4-3p

**MARVIN & CO.,**  
236 Broadway, New York,  
721 Chestnut Street, Philadelphia.  
10

**OIL LANDS FOR SALE.**  
Thirteen Thousand Acres of Land,  
in the Canada Oil Regions, in the Townships of Enniskillen, Iawan,  
Zone, Moore, Brooke and Sombra, for sale or to lease, for Oil pur-  
poses, in portions to suit purchasers.  
For terms and particulars apply to the proprietor.  
4-4p T. D. LEDYARD, 74 Yonge Street, Toronto.

**LABORATORY OF INDUSTRIAL CHEMISTRY,**  
DIRECTED BY  
**Prof. H. Dussance, Chemist.**

Advices and consultations on chemistry, applied to arts and  
manufactures, agriculture, metallurgy, etc.; plans of factories,  
drawings of apparatus. He can furnish the most recent improve-  
ments in chemical fabrications, such as chemical products, petro-  
leum soaps, candles, colors of lead and zinc, varnishes, ceramic  
glass, wines, liquors, vinegars, matches, inks, dyeing and calico  
printing, perfumery, colors of coal tar, tanning, etc., etc.  
He will give all necessary information to exhibitors to the great  
Exhibition. Address New Lebanon, Columbia Co., N. Y. 4

**NEW YORK BELTING AND PACKING CO.,**  
MANUFACTURERS OF  
**Vulcanized Rubber Fabrics,**  
Adapted to Mechanical Purposes.

Patent Smooth Belting, (Patented Nov. 22, 1850.) vulcan-  
ized between layers of a patent metallic alloy, by which the  
stretch is entirely taken out, the surface made perfectly smooth,  
and the substance thoroughly and evenly vulcanized. This is the  
only process that will make reliable Rubber Belting.

Hoses never needs oiling, and warranted to stand any required  
pressure.

Steam Packing in every variety, and warranted to stand  
300° of heat.

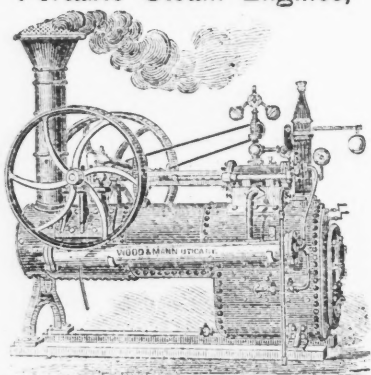
Solid Emery Vulcanite—Wheels made of this are solid, and  
resistible stone or iron; will wear out hundreds of the ordinary  
wheels.

Directions, Prices, etc., can be obtained by mail or otherwise.  
28-4p JOHN H. CHEEVER, Treasurer.

Warehouse 37 & 38 Park Row, N. Y.

**INCORUSTATION OF**  
**STEAM BOILERS.**  
This greatest of evils in the use of steam is entirely prevented  
by the "Anti-Incrustation Powder" of  
**H. N. Winans, 11 Wall Street, New York.**  
INVENTED AND INTRODUCED IN 1855.  
now ten years in successful operation in over 6,000 boilers, with-  
out injury, and saving many times its cost in fuel and repairs.  
A clean boiler generates steam more freely, and will outlast ten  
dirty or incrustated ones. 1vol:2ps

**WOOD & MANN STEAM ENGINE CO.'S**  
CELEBRATED  
**Portable Steam Engines,**



FROM 4 TO 35 HORSE POWER.

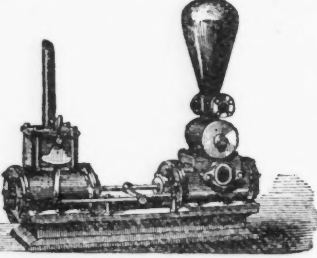
**Also, Portable Saw Mills.**

We have the oldest, largest and most complete works in the  
United States, devoted exclusively to the manufacture of Portable  
Engines and Saw Mills, which, for simplicity, compactness, power  
and economy of fuel, are conceded by experts to be superior to  
any ever offered to the public.

The great amount of boiler room, fire surface and cylinder area  
which we give to the rated horse power, make our Engines the  
most powerful and cheapest in use; and they are adapted to  
every purpose where power is required.

All sizes constantly on hand, or furnished on short notice.  
Descriptive circulars, with price list, sent on application.  
**WOOD & MANN STEAM ENGINE CO.,** Utica, N. Y.,  
12-4p Branch Office, 96 Maiden Lane, New York City.

**NIAGARA STEAM PUMP WORKS.**



**CAMPBELL & HARDICK BROS.,**  
No. 9 ADAMS STREET,  
BROOKLYN.  
20xm  
Send for circular

**STEAM PUMPS.**  
**A. S. CAMERON & CO.,**  
22ND STREET, CORNER OF 2ND AVENUE, N. Y.

**HAVE ONE HUNDRED AND FORTY**  
patterns to select from, arranged to order for pumping  
**WATER, AIR, OIL, MASH, &c.**  
**ACID, LIQUOR, SYRUP,**  
**SYRUP, MASH, &c.**

Pumps guaranteed in the most difficult situations. We refer to  
any first class machine shop in the United States.  
Parties are hereby cautioned against using Steam Pumps ar-  
ranged to work by hand in violation of our original and re-issued  
Letters Patent, covering this feature. 22-xm

**STEAM PUMPS.**  
**Guild & Garrison,**  
**ENGINEERS AND MACHINISTS,**  
MANUFACTURERS OF  
**Steam Pumps, Steam Engines, Vacuum Pans,**  
and all the necessary connections. The Steam Pumps are of the  
following class, namely:  
EXHAUSTOR, AIR VACUUM,  
BALANCE WHEEL, DOUBLE PLEVEEFF,  
DUPELX, WATER PROPELLOR,  
and a number of other plans adopted for different purposes.  
These Pumps are suitable for all the various kinds of Pumping.  
Manufactured and for sale at the  
**STEAM PUMP WORKS, 55 & 57 FIRST STREET.**  
(on same block with the Grand and Roosevelt street Ferry Land-  
ing.) WILLIAMSEURGH, NEW YORK. 16-4p

**STEAM PUMPS.**  
**The Woodward Steam Pump Manufactur-**  
**ing Company,**  
MANUFACTURERS OF THE  
**WOODWARD PATENT IMPROVED SAFETY STEAM PUMP, FOR**  
**MINING PURPOSES AND AS A FIRE ENGINE.**

Also,  
STEAM, WATER AND GAS FITTINGS OF ALL KINDS.  
Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE,  
BOILER TUBES, etc.  
**WOODWARD BUILDINGS, Nos. 76 & 78 CENTRE ST.**  
NEW YORK.  
Corner of Worth Street, formerly of No. 77 Beekman Street.  
GEO. M. WOODWARD,  
President.  
21xm

**HYDRAULIC WORKS,**  
MANUFACTORY,  
**BROOKLYN, N. Y.**  
Steam Pumping Engines, Single and Duplex, Worthington's Pat-  
ent, for all purposes, such as Water Works Engines, Condensing  
or Non-condensing; Air and Circulating Pumps, for Marine En-  
gines; Air Pressure Pumps; Blowing Engines; Vacuum Pumps;  
Stationary and Portable Steam Fire Engines; Boiler Feed  
Pumps; Wrecking Pumps;

**Mining Pumps,**  
Water Meters, Oil Meters; Water Pressure Engines; Stamp  
Mills for Gold, Silver and Copper Ore; Eaton's Patent Amal-  
gamators for Gold and Silver; Steam and Gas Pipe, Valves,  
Fittings, &c.; Iron and Brass Castings.

Send for Circular. E. R. WORTHINGTON,  
61 Beekman street, New York  
19-xm

**THE STEAM SYPHON PUMP,**  
is the most simple, effective, and durable device for raising water  
by steam yet discovered.

It is a  
**Independent Lift and Force Pump,**  
and throws a steady, continuous stream, without piston, plunger,  
valves, or movable parts of any kind.

It is an efficient FIRE ENGINE wherever a steam boiler is used,  
and valuable for raising purposes where the height is not too  
great to which water must be forced. Address  
**STEAM SYPHON COMPANY,**  
4 vol:2 xm 48 Dey Street, New York.

**STEAM ENGINES.**  
**HUBBARD & WHITTAKER'S,**  
102 FRONT STREET, BROOKLYN,  
Manufacturers of  
**High and Low Pressure Steam Engines,**  
Also,  
BOILER, SUGAR MILLS, HYDRAULIC PRESSES, and TIN  
MEN'S TOOLS  
Of all descriptions.  
SHAFTING, PULLEYS, AND IRON AND BRASS CASTINGS.  
Constantly on hand.  
Send for Circular. 26-xm

**PORTABLE STEAM ENGINES,**  
COMBINING THE MAXIMUM OF  
**Efficiency, Durability and Economy,**  
with the minimum of weight and price. They are widely and  
favorably known, more than SIX HUNDRED being in use. All  
warranted satisfactory, or no sale. Descriptive circulars sent on  
application. Address **J. C. HOADLEY & Co.,**  
Lawrence, Mass. ps:20

**B. M. HUGHES,**  
**ATTORNEY-AT-LAW,**  
**DENVER, COLORADO.**  
Refers to SAMUEL L. M. BARLOW, New York city. 10-4p