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WYCKOFF'S CONCENTRATOR.

The importance of having a really good machine by which the sulphurets may be concentrated from the more bulky tailings is acknowledged by all mill-men. We therefore present to the readers of the JOURNAL OF MINING this week, an excellent illustration of a shaking table, by which the operation can be accomplished expeditiously and well. It is the invention of J. N. Wyckoff, Esq., of Virginia, whose "chloride of sodium process" was illustrated and described in our last issue. The tailings are simply fed upon an apron, on which some fifty jets of water flow, washing the sand down into the first row of boxes where the heavy sulphurets are caught. Of course, when the boxes are all full, the richest concentration will be found in the upper boxes. The table shakes sideways, instead of lengthwise as in many other concentrators. The patentee informs us that thousands of tons of tailings have been worked by this machine—all showing perfect concentration. Lower concentrations can be made by taking up the first three boxes and running the tailings into two, or by turning the two into one, which will give the lowest—excellent, as has been proven, for working good gold ores. The debris, of course, flows off, and only valuable matter is left behind. It is also useful in separating free gold, silver, copper, etc., from one another—the metals with the highest specific gravity being caught first, and so on. It can be seen in operation daily at the Reduction Works of Barber & Wyckoff, foot of North Third street, Brooklyn, E. D.

Ancient Mining.

Interesting discoveries have lately been made in the San Domingo mines of Spain, showing the methods of mining adopted by the ancients. In some of the mines the Romans dug draining galleries nearly three miles in length, but in others the water was raised by wheels to carry it over the rocks that crossed the drift. Eight of these wheels have recently been discovered by the miners who are now working in the same old mines. The wheels are made of wood, the arms and felloes of pine, and the axle and its support of oak, the fabric being remarkable for the lightness of its construction. It is supposed that these wheels cannot be less than fifteen hundred years old, and the wood is in a perfect state of preservation, owing to its immersion in water charged with the salts of copper and iron. From their position and construction, the wheels are supposed to have been worked as tread-mills, by men standing with naked feet upon one side. The water was raised by one wheel into a basin, from which it was raised to another stage by the second wheel, and so on for eight stages.—S. F. Miner.

Another New Amalgamator.

Mr. W. M. Fuller, of Chicago, has invented a machine for separating gold and silver from its quartzose matrix. It is claimed that ninety-six per cent. of all the gold in the ore is separated and saved. The principle upon which it works is this: Pulverized quartz is found to be impervious to the air; it is also lighter than lead; and if it can be forced through molten lead, the gold will amalgamate with the lead, and the lighter quartz will rise to the surface. The machine Mr. Fuller uses for carrying out this process may be thus described: An air-tight cast iron vessel is provi-

that gentleman inferred from certain indications that a portion in hieroglyphics must still remain below the surface of the soil. He accordingly communicated his conjecture to M. de Lesseps, who ordered excavations to be made, which brought to light a translation of the cuneiform writing in Egyptian hieroglyphics. The stone bearing this bilingual inscription, which belongs to the reign of Darius, will shortly be conveyed to the museum of Boulae.

The Copper Trade.

Messrs. Vivian & Younger, the metal brokers, have just issued a pamphlet, entitled "Remarks on the position and prospects of the Copper trade in England, as affected by the war between Spain and Chili," in which they state that during the past seven months, the Copper Trade has passed through a period unexampled during the present generation, the salient fact being that the result of the war is that English Copper is £10 per ton cheaper than before it commenced. They observe that this state of things is certainly anomalous, and deserving of some special notice.

From a general review of the position of copper in the world, and having before them many details which it is impossible to embody in a sketch like the present, they are led to three conclusions:

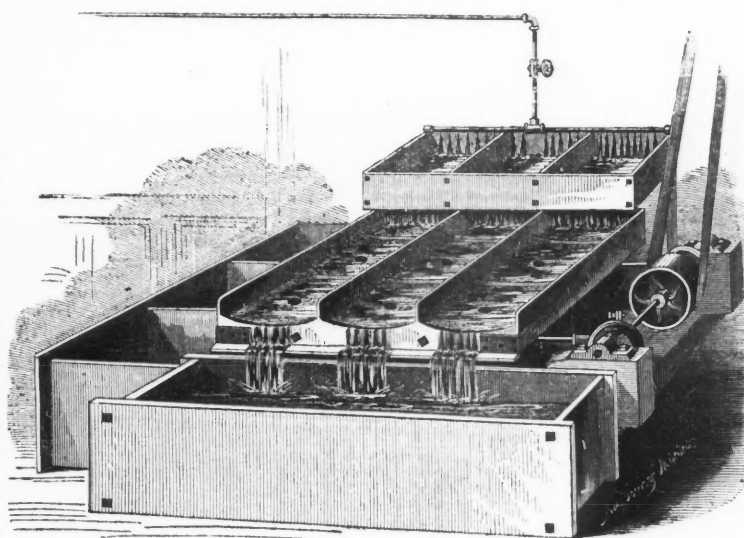
1. That the average value of copper should be dependent entirely upon the relation of supply and demand, subject, of course, to minor variations, such as more

or less speculation, temporary commercial disturbances, etc.

2. That, as more than one half of the world's supply of copper is obtained from Chili, the production of that country should be looked to as the practical index of the value of the article elsewhere.

3. That taking all circumstances into consideration, the value of copper is unduly depressed in this country at the present time.

They estimate, upon good authority, that the total production of fine copper in the world is at present 90,000 tons per annum, of which more than 48,000 tons are exported from Chili. It must, they think, be apparent that their estimate of exports from Chili for the year ending September 30th next, is not understated at 38,000 tons. On this assumption, therefore, there will be a deficient supply of copper from Chili, to the extent of 14,000 tons (as compared with the twelve months ending September 30th, 1865), and the inference is, that unless this deficiency be made up by increased supplies from other parts of the world, or by a remarkable decrease in the consumption of the article, it is fair to anticipate an important improvement in the price of copper during the present year. In the United Kingdom the production reached its maximum in the year 1856, since when a large falling



WYCKOFF'S GOLD AND SILVER CONCENTRATOR

ded, through the top of which a cylinder is inserted, reaching nearly to the bottom of the vessel, and below the surface of a quantity of molten lead contained therein; the lead is heated by a fire underneath the vessel. Thus the surface of the molten lead within the cylinder is exposed to the air, while the air above the remaining part of the lead is enclosed by the sides and top of the vessel and the outer side of the cylinder, and can consequently be exhausted by an air pump. When this is done, powdered quartz is passed through a hopper into the cylinder, the pressure of the air forces it to the bottom of the cylinder, escaping from which it rises, by its own specific gravity, to the surface of the lead, and thence passes over into a tailings receiver, also air tight. During its passage, however, through the lead, it has become pure quartz, having lost all its gold, which is amalgamated with the lead and can easily be separated from it.

Archaeological Discovery.

An important discovery has just been made in Egypt, at Chalouf, a station some leagues north of Suez, where a monument of Persian origin has long been known to exist. A copy of some cuneiform inscriptions found there having been sent to M. Mariette,

off has occurred, the yield at present being only about half of what it was in that year. The government tables for 1865 have not yet been published, but as they know that the mines of Devonshire and Cornwall (which form three-fourths of the total production of the British Isles), yielded last year 9,750 tons of fine copper, against 1,050 tons in 1864, they are able pretty accurately to estimate the total production of the United Kingdom for 1865, and they put it down as equal to 1861, say 13,000 tons. The yield of the Cornish and Devon mines for the first quarter of 1866 is put down, they continue, according to the *Mining Journal*, as 2,220 tons, against 2,498 tons during the similar corresponding period of 1865, which goes to confirm their opinion as to the steady decline in production; the other European production, though in the aggregate of considerable importance, seems, as far as they can ascertain, to remain about stationary, and may, therefore, be considered to occupy a neutral position with reference to the broad question of supply and demand.

The yield from Australia (which is directed exclusively to England and India), has lately averaged about 5,000 to 6,000 tons of fine copper, and the richest mine there (Burra Burra), has become poor, so that altogether the above rate of supply is with difficulty maintained, the tendency being rather towards a decrease in production. The yield at the Cape of Good Hope, though progressive, is at present much too small to have any bearing on the price of copper. The production in the Lake Superior district was 5,300 tons in 1865, and it appears that it reached its maximum during 1861 and 1862.

Should prices in America decline to our present level, the production will probably be much reduced from what it was even last year. California, next to Chili, seems deservedly to attract most attention, but the late high prices have not been upheld long enough to stimulate mining very much in that quarter. The cost of labor, transport, freight, etc., is so much higher there than in Chili, that only rich mines can be worked, unless prices in Europe and America are high. The export of ores from California was last year about 24,000 tons of very unequal produce, and averaging not over 18 per cent., equal to something under 4,000 tons of fine copper. For the present, therefore, at least, its production does not count for much in the position and prospects of copper. Looking, then, to all sources of supply, it would seem that we cannot count on any increased production elsewhere to counterbalance the expected deficiency from Chili.

Taking the world's production as stated at 90,000 tons per annum, Great Britain works up about two thirds of the whole 60,000 tons, of which she exports about 37,000 tons, retaining the remainder for home consumption, the quantity for these two requirements, taken altogether, having doubled itself during the last ten years. The annual increase of consumption of copper in the world is estimated at 8,000, and there is no reason to believe that it will not continue at the same rate. The principal country to which copper is exported from the United Kingdom, is India. The exports from the United Kingdom to Egypt, and the Levant, have been and are usually very considerable, but there was a great falling off last year in consequence of the appearance of the cholera in those quarters. It is fair, therefore, to presume that the demand for India, Egypt, and the Levant are long set in at the usual rate, whilst there is no reason to expect that the rest of the world will not continue to be as large customers as heretofore.

It is very difficult, if not impossible, to procure detailed and progressive information on the head of home consumption, but it is an admitted fact that the consumption of copper in this country is steadily and consistently increasing, although at times a temporary falling off is felt in the demand.

This dullness of demand, and indisposition on the part of manufacturers of copper, brass, and other metals where copper is employed, to replenish their stocks freely, has lasted longer than has been known for many years. This must not, however, be taken to indicate that the average annual consumption is lessened. After reviewing the position of stocks in the various markets, they observe that the conclusion to be formed from a broad view of the stocks in all places is, that although there is an excess of 7,000 tons spread over Swansea, Liverpool, Havre, and London, that excess is about neutralized by the absence of stock of any consequence in Chili, and the unusual barrenness of consumer's stocks all over the world. With regard to prices, they consider that it would be idle to assert that prices of copper in this country cannot see a lower range than at present exists, before a reaction takes place, especially in view of the serious political complications now rife on the Continent, (though during the Russian War, by the way, copper was remarkably high), and the great amount of uncertainty, to say the least of it, felt here in commercial circles generally; but we deduce from a review of the whole circumstances, that the supplies of copper from Chili will probably be deficient to the extent of 14,000 tons in the year ending September 30th next; that this deficiency will certainly not be made up by increased supplies from any other part of the world; that the average consumption of copper in the world is on quite as large a scale as usual, and is steadily increasing.—*London Mining Journal*.

Mining Summary.

Nevada.

The Comstock.—The San Francisco *Brokers' Circular* of May 19th states, that the mining share market has been exceedingly dull, and marked by little or no speculative feeling. A few leading stocks have been well maintained at prices ruling last week. Some have improved a little, though inactive, while others are lower and close weak at the decline. Advices from Nevada are meagre this week, both through official and private sources: but so far as we can learn there is no especial reason why the market should be unfavorably influenced at this particular juncture. . . . Crown Point was sold at \$1,250@£1,225, ex-dividend of \$80 per foot; then at \$1,200. During the week ending 13th inst., 653 tons of ore were extracted. From the west stratum considerable ore was taken last week, of better than the average quality. Active operations have been temporarily suspended in this mine owing to repairs necessary to be made to the shaft, but these improvements are now completed. . . . Savage met with trifling sales at \$970@£960, closing at \$975. No official reports have been received this week. During the past few days the mine has been producing 80 to 90 tons of ore per day, chiefly from the sixth level. The latter is said to look well as its development progresses. . . . Hale & Norcross was sold at \$970, then at \$950, ex-dividend of \$50 per foot, and closing at \$975 asked. There is no change to note in the condition of the mine, every portion of which is said to look well. The drift from the incline will soon be under way for a new level at a depth of 765 feet. . . . Gould & Curry continues dull and inactive. Small sales were made at \$850@£855, closing at \$850. Receipts of bullion for the first ten days of this month amounted to \$64,000. Explorations in the lower drifts are progressing with great vigor. . . . Yellow Jacket rose from \$715 to \$755, then sold at \$775, and was dealt in yesterday at \$735@£740. The officers of the company in Nevada have not as yet furnished the stockholders in this city with an exhibit of their affairs for the past month, nor have any official statements been made public since the 25th of April. We are informed, however, that certain portions of the mine are more promising than for some time past. . . . Ophir is in less request, and some 400 feet have been dealt in; declining steadily from \$570 to \$460, rallying to \$455, dropping to \$450, then selling at \$400@£410, and closing yesterday at \$425. Developments this week are thought to indicate a material change in the quality of ore to be taken from the ninth level. In stopping up and in drifting north little or no ore has been met with recently, but in going south it is said to hold out well. . . . Chollar-Botosi has been in little favor, and very considerable sales were made, advancing from \$326 to \$357½, receding to \$341, then selling at \$346, and closing at \$337½. No official reports have been received this week, but private advices represent an improvement in the appearance of several stations. . . . Alpha receded from \$305 to \$255, and then sold at \$240. Belcher is also lower, declining from \$332 to \$307½, and selling yesterday at \$300@£305. Empire Mill and Mining has been dealt in at \$175@£177½ per share, closing at \$170 bid. . . . Imperial rose from \$128 to \$132, dropped to \$128 again, then sold at \$131, and changed hands yesterday at \$130. The Comstock Point mill reduced some 2,300 tons of ore last month, averaging \$34 19 per ton. It is thought that considerable ore can yet be taken from the sixth level. The drift for the next level below is in some 160 feet from the shaft. . . . Overman has been actively dealt in, and nearly 1,000 shares were sold, advancing from \$82 to \$87, steadily declining to \$73, then selling at \$74, and closing at \$65. Bullion fell from \$90 to \$80, rallied to \$84, and sold yesterday at \$80. Daney has been sold at \$11, and Golden Rule at \$20. . . . The total recorded sale of stocks since Saturday last, inclusive, amounted to \$7,37,547.

Humboldt.—From the *Register* of May 19th, we glean the following: Two assays made this week of quartz from the Silver Bullion claim show \$140 and \$198 the ton. The ledge now working continues looking the same, only gradually widening. . . . During two weeks past, several parties have been making discovery, or re-locations, rather, of very promising auriferous quartz veins in the range which terminates some thirty miles down the valley, in Table mountain. The ledges are of good width, well defined, and very rich in free gold. Some, if not all, of these ledges had been located years ago; but the proper amount of work to keep title good not having been done, others have got hold of them. . . . The Ruby Silver Company, owning in Pine Forest District, thirty miles above Blackrock, has an excellent ledge. Voshay has put a shaft down between casings, and the walls of the ledge make just the right walls for the shaft—five feet apart. The entire ledge is infused with the ore, which works, without assorting, \$30 in silver, and shows by assay fifty per cent. copper. Pine timber abundant and large only seven miles from the ledge, and a fine creek of probably 1,000 inches of water, permanently runs at a distance of three hundred yards from the ledge. . . . The Volunteer is the name of a ledge in Sierra (Cal?) owned by Captain Conrad and others. A small lot of quartz from it was worked this week at Holt's mill. It turned out a good-sized brick of crude bullion, in which gold shows plentifully. The value has not been ascertained, but Belbach is to melt and assay it to-day. It is estimated to pay \$40 to the ton—gold. The bullion we saw was the result of unsorted rock, taken in mass from the full width of the ledge—almost six feet.

Battle Mountain.—Dr. Blatchly having just returned from this new copper district, states that it lies one hundred miles north of Austin, west of Reese River, and south of the Humboldt, and near the point where it receives at present the waters of Reese. It lies in a range of low hills trending northeast and southwest, which are separated from the northern termination of the Shoshone range of mountains by a valley from ten to fifteen miles broad. The mines which have

been located lie in two groups, about eight miles apart, and the intervening portion of the range is apparently barren of mineral. The southern group, in which are located the Virgin, Troy, Mary Louisa, etc., is situated on the east side of Copper Canon, a low, smooth hill, about three-quarters of a mile long by half-a-mile wide. The ledges are encased in porphyry, and the hill presents a regular plexus or network of veins of varying size, containing the richest and most beautiful of copper ores. The different veins exhibit native copper, red oxide, green and blue carbonates, and, in one instance, pure sulphuret of copper, a most elegant specimen of which may be seen in the cabinet of Doctor Blatchly. Except the sulphuret, these ores are always found near the surface, and the same relative differences are observable at various depths in veins of copper that occur in veins of silver. The veins lie so close together in the hill, as to lead to the conclusion that at no great depth they will be found to be branches or spurs from one vast vein, and in any part of the world affording facilities for the transportation of the ores, they would all be worked with immense profit. This one hill seems to contain all the valuable deposits of copper that occur in this portion of the district; at least, this is true so far as the explorations have extended. On a number of adjoining hills there are traces and copper stains, but they do not apparently indicate the presence of veins. This section of the district may be readily entered over good natural roads both from the Humboldt and Reese River valleys. Timber and water are scarce, only one small spring having been discovered in a distance of about five miles. The northern group extends over a greater area, and the veins are larger, better defined, and of more uniform size. Several of the veins were apparently of great width, perhaps twelve or fifteen feet, but being wholly undeveloped, their width could not be ascertained with accuracy. The ore obtained from the veins was generally similar to that found in the southern group, and the green and blue carbonates predominated; no native copper had been found, and in one instance only red oxide of copper had occurred. The principal veins located are the Trojan, Victoria, Blue Bell, and Fort George. They are all well encased in porphyry, and present every indication of strength and permanence; but they require developing to exhibit fully their various points of excellence. This portion of the district is, if possible, more completely accessible over nature's highways than the southern portion, and is only eight miles from the Humboldt river, and near one of the proposed routes of the Pacific Railroad. Wood is fully as scarce as in the mountains south, while water is, at present, very plentiful; but whether the source was accidental or permanent, remains to be seen. If the mines of this group should prove upon development, equal to their superficial indications, they will be ranked among the foremost copper mines of the world.

Palmetto.—The *Enterprise* of May 22d, states that this new quartz mining district is twenty miles south of the Silver Peak District, in the southern portion of the State. By Mr. W. H. Douglass, who has just arrived from that section, we have been shown, says our contemporary, some very fine specimens of quartz taken out of the Sylvan, Champion, Silver Circle, Criterion, Eclipse, Prize, Ruby, Sandusky, Black Hawk, Mountain Gem, and Commercial lodes. The locations are 1,000 feet each. The ore exhibited to us shows copper, cobalt, galena, and antimonial silver. It also shows horn silver in abundance, and is very rich in chloride of silver. From assays made from the croppings of the Champion ledge, it yields from \$100 to \$300 in gold to the ton, and from \$545 to \$2,427 in silver. The balance of the ledges mentioned assay from \$30 to \$3,000 per ton in gold and silver, the principal part being silver. To judge from these assays, the ore is equal, if not superior, to that from the famous Diana, at Blind Springs. The ledges are found enclosed on either side in a formation of granite and siliceous slate. The immediate enclosing walls are tough black clay, similar to those of the Comstock ledge. The dip of the ledges is to the eastward from perpendicular to an angle of forty-five degrees; each ledge is well-defined, being traceable for the distance of a mile or more, running in a course about northwest to southeast. The ledges are from two to twelve feet in width and are thought to be of a more permanent character than those of Silver Peak District. There is plenty of nut-pine wood and water surrounding these mines. Bunch grass also exists in abundance in the district. There are about fifty locations of claims made in the district thus far.

Silver Peak.—The party of men who left Virginia City some three months ago for the Silver Peak and Red Mountain country have been at work upon the New York ledge, located about four miles west of Silver Peak, and have struck very rich ore. This lode is reported to be about fifty feet in width, and shows thousands of tons of the very best looking quartz in the croppings. The company known as the Red Mountain have sold out their ledges to a Mr. Martin for a big sum. This gentleman intends to prosecute the work upon them with vigor. The Douglas and Warren companies have also sold out their lodes to Catherwood of the New York and Silver Peak Corporation. Other sales are reported to be to have been made to parties whose names we do not know. Our informant states that great confidence exists in this district as regards the wealth of all the ledges in that section.—*Enterprise*.

Clan Alpine.—The *Enterprise* mentions having seen a beautiful bar of bullion from the McGregor ledge, Clan Alpine District, Nevada, owned by a New York company. The "brick" weighed 302 ounces, and there is reputed to be plenty of material in the ledge to manufacture plenty more of the same sort.

Lander.—The *Reville* of May 23d says: The Fortuna mine yields the richest chloride ore. About five tons have just been reduced at the Midas mill, and the pulp assays yielded at the rate of \$943 per ton—the mill guaranteeing to work up to eighty per cent. of the assay.

Twin River.—The *Nye County News*, of May 19th

notices a rush to Twin River district, now the summit is in good condition for travel, and adds: From an excited prospector, who returned from Twin River a few days since, we are informed that the Buckeye mine, North Twin river, is taking out ore so rich that it is almost pure bullion. We are also informed that work is going ahead on the mill and mine of the Murphy company. There will doubtless be a large population in that section the coming season.

North Twin River.—Some valuable mines in this district are about to be worked by a Pennsylvania company, viz.: the Fairmount, Bigler, and Twin Ophirs No. 1 and 2. The *Reveille* says: Prior to the purchase of the mines, they were frequently and thoroughly examined, under the instructions of the present owners, by competent persons, the result of which may be summed up by selecting the following telegram from Messrs. Boalt and Stetefeldt: "Austin, January 29th, 1866. Have examined Fairmount and Twin Ophir mines, North Twin River District, and find them large and well defined; consider them first-class. Selected ore ourselves—Fairmount, \$430, and Twin Ophir, \$66 per ton." Assays of ore from the Bigler, taken from the croppings high above the surface, ranged from \$30 to \$30 per ton. All the ledges crop out boldly, and have been traced nearly their entire length. They lie parallel, and at a considerable elevation above the ravine or creek; and it has been estimated that a tunnel a thousand feet in length would cut all four at a depth of a thousand feet. At the point where the Fairmount had been opened and cut transversely, the vein was found to be nearly ten feet thick, the lower half of which exhibited the finest quality of sulphureted ore. Of five assays of this ore, the yield varied from \$230 to \$500 of silver per ton, and as high as \$40 of gold. The assays showed no base metal, except the slightest trace of lead. Indeed, the mineral obtained from the Fairmount seems to be remarkable, containing only silver and gold in a handsome gangue. The Bigler and Twin Ophirs are also large, well defined ledges, but contain more or less base metal. The property of the company seems to be entitled to the rank of first-class, and good and systematic management will undoubtedly sustain the judgment.

Toiyabe.—Says the *Reveille* of May 22d: We have just been called upon to share the joy of a happy miner, whose mine has yielded its first pale fruit. Yesterday afternoon, Mr. C. C. Land, laid upon our table a handsome silver brick, of the value of \$227 56—the first yield of the Colfax ledge, South Bend county. It was the product of only 1,450 pounds of surface ore, reduced by Varney at the Ware mill. The ledge lies high up in the Toiyabe range of mountains, where they flank Smoky Valley on the west, and is scarcely seven miles south of Austin. It belongs to Capt. A. L. Page, C. C. Lane, and Albert Rose. The property had been sent to the East for sale; but it wouldn't sell, and the owners resolved to bring it to fruit by their own exertions and means. We believe they have done wisely, and we wish that other owners of mines would conclude to do likewise. If the mountain won't come to Mahomet, it is sensible in Mahomet to go to the mountain.

Santa Fe.—Another mill is about to be erected about mile east of the Sterling mill, and near the sink of the Big Smoky Creek. The company that is engaged in erecting the mill owns the Mother ledge in the Santa Fe District, about three miles from the mill site. This mine, as its name indicates, is regarded as the parent vein of the district; and as it has been steadily worked for some time, a large amount of good ore has accumulated.

Bunker Hill District.—We have received, says the *Reveille*, May 18th, the following data in relation to this district, from a person who is well advised of its condition, which he requests us to publish in order to correct the erroneous impressions caused by Mr. Stuart's explanation of the cause that led to the closing of the Sterling Company's mill at Kingston, of which he is the present Superintendent. The writer gives the result of the working at that mill of eight tons of ore from the Brown ledge in the district, as follows: silver, \$334 76; gold, \$57 64; total, \$392 40; or an average yield in gold and silver per ton of the value of \$49 04. According to his statement, Mr. Stuart expressed the opinion that he could work such ore in his water power mill with profit at the rate of \$30 per ton; and assigned for the cause of stopping the mill that the parties furnishing the ore had raised the price from \$5 to \$15 per ton, admitting at the same time that there was plenty of ore in the district. The writer says further, that the assays of the pulp of the ore from the Brown ledge, made for Mr. Stuart at the assay office of the National Bank, gave of silver, \$67 54; gold, \$10; being the handsome average of \$77 54 per ton. And he concludes by stating on the authority of one of the owners of the Brown ledge, that there are over 300 tons of the same quality of ore on hand, and an extensive quantity in sight.

Virginia District.—We gather the following items from the Territorial *Enterprise*: The Imperial is now running a drift at the 50-foot level westerly towards the red rock portion of the ledge. At present this mine is considerably troubled with water in their lower level, but have managed so far to keep it under. . . . We examined, on yesterday, a small lot of very rich silver ore, taken out of the Kentucky mine, Crown Point Ravine, at the 275-foot level. It was very rich, and a ton of the same sort was estimated to be worth \$10,000. There is more of it.

Crystal Rock.—A few days since, says the *Enterprise*, 19th ult., a small lot of quartz was brought into one of our mills from this section, which is some 230 miles from here, in the southern portion of Nevada, which worked by mill process \$390 to the ton. From the result, the owners of ledges there are very jubilant. The work upon all the ledges has been stopped on account of the failure of the successful working of the New York Company's mill, now waiting for some improvements that are to be added to the machinery,

which it will probably take some four months to complete.

Kearsarge.—Recently Van Wyck & Sanchez, Gold Hill, received an amount of crude bullion which, when melted and assayed, formed a "brick" weighing 113½ pounds avoirdupois, and was valued at \$1,769 15.

California.

Nevada.—According to the Grass Valley Union the new machinery on the claim of Frank Moore & Co., works to a charm. The incline is now in some forty feet, and will be pushed to a depth of one hundred and fifty feet for the first level. . . . The Illinois and Wisconsin companies have been consolidated into one, and work will now be pushed on rapidly. . . . The new hoisting works at the Alison Ranch are nearly ready. The southern incline is down some three hundred feet, and cuts a very handsome ledge between the upper and lower levels. This ledge has been named the Carriboo, and promises to be richer than anything that has yet been discovered. . . . The *National* says: A vein of very rich rock was struck a day or two since, in the Soggs' mine, on Deer Creek. The rock which the company have been taking out heretofore, paid about \$40 per ton. . . . Rough and Ready, although it has twenty or thirty ledges in its vicinity, which would pay for working, is at a standstill for want of capital to develop them. . . . At the Lone mine, the amount realized in a week's run, was one hundred and eighty ounces. The company are still on the first level and the mine is, comparatively speaking, yet unopened. . . . North San Juan is rising again. All the claims there, says the *Transcript* are paying nearly double their old yield, a great many new ones are opened, and thousands of dollars have been taken out every week. There is not a house for rent there, and the merchants are all doing a very healthy business. . . . The Nevada *Gazette* says: Some years ago, a Frenchman named Dueray accepted, in payment for a debt of \$30 dollars, a claim situated near the office of the ditch company. This spring he thought he would try his claim, when he struck into a lead of gravel, which had been covered up by an old slide, and after running four weeks he cleaned up 465 ounces of gold, worth \$19 an ounce, amounting in all to a little over \$5,600. . . . The locators of the first northerly extension of the Fox copper ledge have been offered \$70,000 by some San Francisco capitalists for their location. The location consists of ten claims of one hundred feet each. Five or six companies have located claims upon the Hermitage, a ledge four hundred yards west of the Fox ledge. . . . We saw, yesterday, a very rich specimen of gold-bearing quartz taken from a ledge near the mouth of Wolf Creek, opposite Snow Point. A company was formed and claims located. The ledge is about three feet wide and so far as prospected, is remarkably rich, and pays them handsomely for working it in a hand-mortar. . . . A rich quartz strike was made a few days ago near Bush Creek. A tunnel into the ledge struck a pocket from which the discoverers have taken out several wheelbarrow loads of quartz, which is literally filled with gold, and which is separated by pounding in a mortar. . . . A lump of gold worth \$206, was taken out from Binsley & Co.'s claim, on Kentucky Flat, a few days ago.

Tulare.—A Kern River correspondent writes: The quartz discoveries are of daily occurrence, and rock that will not "horn out" at the rate of \$40 per ton is passed by with contempt by the prospector. Among the lodes opened and paying, I may mention that of Mills, McDonald & French, Parson Higgins, Tucker & Collins, all worked by arrastras, and, especially the lode first mentioned, paying well. The Long Tom mine, owned by the Roberts Bros., is, I am informed, paying large profits. This lode is from six to nine feet in width of solid gold-bearing quartz. The main and air shafts, about forty feet apart, are down about one hundred and twenty feet. The company have a ten stamp steam quartz mill, crushing day and night. A quartz mill to do custom work is much needed here. . . . The Piute is a new district, three miles east from the Hot Spring Valley. Rich prospects have been found. . . . The *Delta's* correspondent writes from Inyo: Almarin B. Paul's mill will be running before this reaches you. The Pioneer mill will be in operation in a very few days. The Kearsarge Company's mill is also nearing completion. There is enough rock in sight to run a twenty stamp mill a year. The Chrysolite Company are working about twenty men on mill and mine. Colonel Stevens, with a stiff force at the head of Owen's lake, is going ahead prospecting the A No. 1 ledge, and expresses himself as more than satisfied with both ore and ledge. Prospecting is still going on, and new discoveries are constantly being made. Some of the rock of Fish Spring district is now being worked in the mill of Thomas Passmore.

Sierra.—The *Messenger*, of May 12th, says: From the hydraulic mining camps we hear that the water has nearly failed with most of the companies, and though it fails early, the yield of gold has been unprecedented. At Eureka, we hear the water cannot hold out more than a couple of weeks, and it is probably the same elsewhere. Many of the diggings will return a net profit of double their former yield, and money will be more plentiful than for several years. . . . A correspondent at Alleghany says Gov. Newell is below, and report says he intends putting up a new mill on his return. The Twenty-one Company will soon erect a new mill, with a hurdy-gurdy wheel, running four stamps, with capacity for more. The General Sherman ledge, owned by Bob Waters, prospects well. The Oak Flat Company still continue to get encouraging prospects, and intend to start their mill soon. The Fac Simile Company have resumed operations. The Union Company are running their mill with encouraging results. Rice, Wright & Co., are recontacting the old Fremont Company, which will doubtless prove highly remunerative. The Masonic is repairing and consequently working only one-half their force. Their prospects are cheering. . . . Messrs. Cole & Stevens, of Brady City,

have just completed the building of two or three miles of mining sluices. The *Marysville Appeal* says that last week they cleaned up two of the upper flumes and took out 420 ounces of gold. . . . Jim Messerve has sold his share (one-half) of his lately discovered quartz ledge, to an Eastern company for \$1,000.

Trinity.—The *Journal* says: The gold of Canon Creek will be very large this year—much larger than it has been for several years past. The ditches owned by Jos. Depinett, Flowers & Co., Major Price, and Adam Berger, are flowing full of water. The new tier of claims lately opened along the hillside below town, are paying well. Mark Knowlton & Anstead are taking out a hundred dollars a week, and other claims pay regularly from \$5 to \$10, and an ounce a day to the hand. . . . Wm. O'Brien and Joseph McIlvane started from Weaverville for the Atlantic States on the 2d of May. They had been mining on New River during the past winter, and the amount realized, added to that for which they sold their claim, reached the snug little sum of \$5,300, which they carried with them in New River dust, the particles of which varied in value from 50 cents to \$50. On the 5th of this month Steve Noble, Albert Pruett and John Kench, sold at Greenhood's Bank a pint dipper full of the same kind of dust. Four pieces of this last lot weighed over \$500—the largest being worth \$199.

Alpine.—The workmen on the Mowyer are now in over seventy feet with the tunnel, and making good headway. . . . The last load of four tons of Buckeye No. 2, had been hauled to the Pioneer mill for a working test.

Amador.—The *Dispatch* having received specimens of rock from the Mount Echo and Tussimta claims, on the celebrated Soapstone, or talc lode, located on the divide between Dry creek and Horse creek, about four miles below Drytown, thus speaks of them: The specimens are studded with fine gold, and have the appearance of the richest kind of specimens of quartz rock; and yet the substance is entirely clear of grit, and so soft that blocks can be whittled or shaved into any imaginable shape. We are credibly informed that twenty-four hundred pounds of the rock, which was crushed in one of the quartz mills near Amador City, yielded thirty-six dollars and twenty-five cents. It has been found by actual experiment that the rock can be ground in a common flouring mill at the rate of one hundred pounds per minute. In fact 1,300 pounds were crushed in a flouring mill near Lone City in thirteen minutes. The shaft in the Mount Echo has been sunk to a depth of fifty feet, and the vein is ascertained to be about twenty-two feet in width.

Shasta.—Noah S. Batcheller, who arrived in the country on April 4th, recollecting the quartz he saw in Shasta County, in 1851, proceeded directly to the vicinity of Ellsworth's saw mill. He "struck it," and located three ledges, which he named the "Chicago Series." "The news of the discovery spread like the wind," says the *Courier*. The editor of that paper visited the ground, and picked up a piece of the rock, which seemed to be all alike, and had an assay of it made in town. The result makes the value \$255 to the ton, in silver. It was not tested for gold, although it is thought to be rich in that metal also. A new district was created and named the "South Fork." . . . The same paper, speaking of the Washington Quartz Company, says: During the space of a year, the mill has crushed 1,400 tons of rock, from which the company have received \$15 per ton in coin over and above all expenses for melting, assaying, brokerage, express charges, etc.

Tuolumne.—The *Courier* states that a five-stamp mill, with capacity for ten stamps, will at once be erected on the Starr King claim near the Grizzly. . . . Silver ore from Columbus district yielded by assay 116 ounces to the ton. . . . A 10-stamp mill has just been completed for the Mississippi vein, at Oak Flat. . . . Placer mining is carried on in and around about the city of Columbia to a greater extent than most people throughout the country dream of—in fact, it may be said that the placer mining of the county is centered now up in this district.

Plumas.—A correspondent of the *Quincy Union* writes from East Branch: The Taylor Hill Company are not working their claims this season, but they are selling all the water their ditch can carry. . . . The Bunker Hill Company have plenty of water, and the opening in their claim is growing large very fast. McElroy & Co., on the beach above Long Bar, are doing well. Butler & Co.'s claim, at the Junction, prospects as well as ever; they have one of the best claims on the river. The Pea Soup Company are at work "bottoming" up, and are getting good pay.

Mariposa.—Conlerville correspondence of the *Gazette* states that H. G. Cowan & Co. have gone to work in earnest in the old Marble Spring vein. . . . Wright & Spencer have started their new mill on the North Fork, near the Bower Cave. . . . Captain Arni is crushing rich rock out of the vein recently struck by him, and now owned by himself and John Hite and other partners.

Calaveras.—The *Courier* says: Prospecting is still on the increase. We have heard of several new discoveries being made within the past week—real, bona fide gold-bearing quartz leads—upon the most of which men are already earnestly at work. The sulphuret lead, in Dutchman's Gulch, is being systematically and rapidly developed. A large number of men are employed in this mine, and it is the intention of the company to erect a mill the present season. The custom mills are all crowded, and there is now more rock out than they can possibly crush during the season. . . . The Gold Hunter, in Salt Spring Valley, is now yielding rich rock. . . . The new quartz discoveries at O'Byrne's Ferry had caused a considerable excitement in Copperopolis.

Yuba.—The mines at Brown's Valley are again coming into favor. The Pennsylvania, Dounebrogue, and Yuba, will be crushing rock in the course of three

weeks. The Jefferson Company is still taking out rich rock.

Placer.—At Dutch Flat Messrs. Judd, Kinder & Stewart, composing the Gold Run Company, lately cleaned up \$2,700, after a run of twenty days, ten hours per day, with 300 inches of water.

Contra Costa.—The Welch quicksilver mine is said to be developing promisingly.

Montana.

The *Post*, of May 19th, says of the Mesler lode: This fine piece of quartz property is now on the way of thorough development. The Foster mill (24-stamp) will soon be up from the river, where it has lain all winter, and will be located on this lode, which is right in the gulch below Summit. . . . Miles Kavanagh, of this city, has \$25,000 lodged to his credit, on account of a sale made of his interest in the celebrated I. X. L. lode.

Silver Bow Gulch.—The *Post* says: We are glad to report that the claims on Silver Bow Gulch are rising rapidly in value, on account of striking the real pay channel and the discovery of auriferous deposits in the bars lining the creek. A company of eight men are now engaged on a ditch which will supply water for the sluicing of about 1,200 acres of dry diggings, lying between Brown's Gulch and Silver Bow Creek. There is a fine prospect obtainable at the very surface of the ground. All the company, and those outsiders who have prospected the ground, feel sure that it will yield from \$25 to \$35 per day to the hand. A friend of ours, owning an eighth interest in the ditch, was offered \$500 in banker's dust for his share, before he had paid a single dollar of assessment. There is any amount of work at \$6 per day, for all who want employment. This is good news for the immigrants.

Mill Creek.—This flourishing section of fine quartz ground, abounding with agricultural facilities and requisites of the highest order, is at present progressing rapidly, both in a mining and in a farming point of view. . . . A 50-stamp mill is now on the road to this creek from the Eastern States.

Wisconsin Gulch.—Bill Fairweather has struck it again. His hydraulics at Wisconsin gulch are paying. The first clean up was one hundred ounces to a fortnight's run; the second time, the weather was favorable and all in working trim, therefore, in four days, one hundred and fifty-six ounces were washed out. This is pretty well for poor folks.

Alder Gulch.—The rapid melting of the snow is causing great injury to miners, by the sudden flooding of their claims.

Bannack.—From Bannack correspondence to the *Montana Post*, May 19th, we condense the following: "During the present season we shall see the beginning of better times in Bannack. Mr. Hopkins, of the Butterfield Company (No. 6 Decatur) is expected here by the 25th inst.; and Mr. Purple, of the same company, was at Atchison, last month, shipping supplies, and has a mill en route for Bannack, to be set up on the Huron, which is supposed to be one of the best silver lodes in the Blue Wing district, and was sold for \$100,000. Professor Eaton has sold the Wide West, in the same district, for a large sum, and is on his way to Bannack via California. He has shipped his furnaces, material and machinery, which are to be put up here and at Rattlesnake, for the purpose of smelting silver ores, some of which he tried last fall, before returning East, with astonishing success. Messrs. McDonald, Clark, Gridley, Sullivan, Thompson and Governor Edgerton, have made large sales of property. It is reported that Mr. Sullivan has sold his own property for \$80,000, Governor Edgerton for \$25,000, and Gridley for \$15,000. Mr. Hopkins writes that a million of dollars will be spent in Bannack, by capitalists, this season, in the purchase of property, and advises not to send any more East for sale. Mr. Reem writes that millions will be spent here this season, for property, furnaces and mills. Mr. R. is one of our best prospectors, and he and his partner (Mr. Bender) sold \$60,000 worth of property, last fall. Messrs. Bender, Estler, Godfrey and others have formed, perhaps, the most extensive company for mining that has ever been organized in the East for this district. This company has issued a very important pamphlet, in which they set forth the value of our leads, having had them "tested" in every possible way, by the ablest assayers in the East; and usually with the most satisfactory results. Mr. Fowler, of New York, has, also, purchased property here, and is now at home purchasing and shipping machinery. His early return is confidently expected. There can be no reasonable doubt of the value of the property which he has selected. Professor A. G. McComb, Superintendent of the Gold and Silver Mining Company of Montana, will also return early, to begin operations on their property. He intends to have the best machinery, and to adopt the best processes known for the separation of the precious metals. This is a working company, solely; not having a dollar of stock for sale, but only a working capital of \$100,000; and is formed of the best and ablest men of New York. Colonel N. E. Wood's mills for the New Jersey Company will be here early in the season. He is still going down on No. 12 Decatur, with the most satisfactory results. Then we shall have a large amount of bar mining done by the Bannack Ditch Company, and there are untold millions lying in the bed of the creek, which, at no distant day, will be taken out. Now, put all these things together, and what may we not expect for Bannack and Montana cities.

Reynolds City.—Correspondence from this portion of Montana states that: "Rock and dirt mixed with the precious ore abound over a large portion of this place, and indications of good paying ground are daily found. The only drawback to this country is the great scarcity of water; in fact this commodity is almost as hard to get as money in this town. Goods are plenty, and sales dull, at about the same prices you sell for in Virginia. The miners are taking out very little money

yet; they are opening their claims, and all seem to have fair prospects. If this is the case, after a while there may be a lively camp and plenty of money. Many people are tramping over the country, and comparatively few are employed. Not a few are going to Harvey's Gulch, some forty miles from here; "big thing" reported about it.

Diamond City.—A letter, May 12th, from Diamond City, says: "Water from the Boulder, was run on to the Montana Bar, the 7th inst., and a large concourse of people assembled to witness the operations of the hydraulic on the claims of Metcalf & Co., which, with a head of nearly 90 feet, did good execution during the week, although delayed several times. They have opened a hole in the ground, that has convinced the most skeptical that that is the thing after all; during the week two others got into operation on the same bar, and a fourth will soon be ready. Several ground sluices are also running. The hydraulics, at present, are simply cutting down the heavy bank. Mallory's Bar is also opening finely, and bids very fair for the future. On the rims, in the main gulch below, they are clearing from one to two ounces per day to the man. Uncle Johnnie's Gulch, and the bars on White's Gulch, are yielding a rich harvest to claim owners, and that is but an earnest, indeed, of what lies at the bottom of the main gulch. New York Gulch is still and justly attracting the attention of a large number of miners. The town is rapidly improving, and the claims indicate great wealth. It is no trouble to take out \$100 in fifty square feet of bed rock; and, as the streak is very even, and from fifty to one hundred feet in width, there is from \$20,000 to \$40,000, and even more in each claim. It must also be remembered that not more than half the gold can be obtained from the dirt the first time that it is washed. Greenhorn Gulch, coming into the main gulch just at the upper end of town, is of great wealth at the lower end. Where it has been tested, as high as \$16 to the pan has been taken out. The drains to it are being rapidly completed, and it will soon tell its own story. The great quartz excitement near and beyond Trout Creek continues; other lodes as rich as the former, continue to be discovered, and, as yet, this is but the beginning.

Colorado.

D. C. Collier, editor of the *Central City Miners' Register*, and who, by the way, contributed an excellent paper on "Chalk and Cretaceous Deposits of Eastern Colorado," in the May number of *Silliman's Journal*—having arrived in Central, is going "among the mills." The first works visited—June 14th—were the smelting and reducing works under the management of Mr. Danforth, in the upper end of Eureka Gulch. "The works," says Mr. C., "are not extensive, being rather constructed for the purpose of experiment than for practical working. The Crosby & Thompson Desulphurizer has been tried, but is now rejected and condemned. The means used for crushing is a Blake's crusher. From this the ores are conveyed to a jigger and buddle, and the quartzose portions separated from the heavy sulphide ores. The ores are then roasted in a reverberatory furnace, which also serves for the purposes of smelting. It is built mostly of granite, but six hundred fire brick being employed, and these for the arch of the furnace. The hearth is of slag, put in at a temperature of five thousand degrees of heat, Fahrenheit. The granite employed is very fine; some of the blocks were five or six feet in length. They were taken from the bluff west of the smelting works; it is the finest granite for building purposes we have ever seen in Colorado. The furnace is not a large one, but appeared to answer the desired purpose well. At the time of our visit the furnace was charged. That the ores were thoroughly desulphurized was evident from the almost entire lack of the sulphur smell from the fumes. We did not wait to see the charge drawn, but hope to report the result in our next. The ores run were from the King lode, the property of the company who own the works. The ore is a mixed sulphide of lead, andimony, zinc, iron and copper, containing silver and gold. The zinc is mostly got rid of with the white quartz by buddling. The residue is about two-thirds lead and antimony to one-third of iron and copper sulphides. It is thought that the ores can be smelted after roasting, without the addition of fluxes. Leaving this establishment, we called at Whitcomb's mill and examined Colton's separator. We shall not at this time attempt to describe its construction or working. It evidently does its work very thoroughly. The tailings which passed through this machine and were thrown aside, contained very little sulphide, except that of zinc, usually known as black jack, while the heavy, valuable ores were perfectly free from quartzose matter. The remarkable feature of the machine is its simplicity and the smallness of the amount of power required to work it. These machines should be placed at the lower end of every amalgamating table in the mountains. But little additional power would be required, and all that is valuable would be saved. We do not have a particle of hesitation, after seeing it work and seeing what it accomplishes, to say that it must prove very valuable." . . . From the *Register*, of June 5th, we also condense the following: The Black Hawk Company cleaned up and retorted, as the result of last week's work, twenty and one-half pounds of bullion. . . . The Powers lode, in Nevada District, is opened to a depth of fifty-five feet, and has a crevice three feet and eight inches wide. The ores appear to be of very superior quality. They are composed of sulphides of lead, iron and copper. James E. Lyon gave fifty dollars per ton for them, and offered the same price for the future. They will undoubtedly prove rich in silver as well as gold. Mr. Briggs has bought two hundred feet of the lode, including the discovery shaft, and will put a force on at once to develop and work the property. . . . The Barker and other lodes on the Castle Hill are to be worked at once by a Philadelphia company with sufficient capital. The Barker is a good lode. . . . Several Eastern capitalists were arriving at Central to look at the mines. . . . A company has been formed to

work property on Fall river, for which they have just paid \$200,000 on the recommendation of a scientific man from Toronto, Canada, Prof. Chapman. . . . Mr. Kip is putting up pumps in both the Kip & Buel Company's shafts on the Leavitt lode. The ore thus far looks finely and promises well. . . . Mr. Cheaney, of Lake Gulch—the only man who has not sold out his mill since he brought it to the Territory—will start up work again to-morrow. He has always made money whenever he has run it, and believes that with his usual economy he can continue to do so still. We have never heard him complain that there was no money to be made at mining. . . . The Noble Gold Mining Company's new ten-stamp mill started June 3d. . . . Hon. J. T. Lynch has raised \$50,000 dollars working capital for the purpose of developing the Suky lode near Montgomery, Snake river. The lode we know to be rich in silver. It has a wide crevice and good ores. . . . Mr. Leeper reports mining matters as looking up very considerably at Empire. He has driven the tunnel of the Leigib Company two hundred feet, and has a force at work day and night. In doing so he has discovered four new lodes, some of which are very rich. He has also passed through the property of the company, on this Tenth Legion. He is not now reducing the ores, but is putting up a Keith furnace, for the purpose of doing so. Both he and his company are in excellent spirits. . . . The Congress Gold Mining Company are working claim No. 1 on Saratoga lode in Russell Gulch. They have a 145 foot shaft sunk down to good ore, and feel considerably elated at the prospects ahead. . . . In a recent run from the ores taken from Sensenderfer's claim on the Bobtail, twenty per cent. by weight of the bullion taken out was shown by assay to be silver. Now, at a depth of 350 feet, there is more galena in the ore than at any previous time. Were the ores worked for silver, the percentage would be many times greater. . . . Gold shipments for the week amount to about 1,000 ounces, and it is divided as follows: The Narragansett Company, 150 ounces; Sensenderfer, 95 ounces; the Gummel Company, Fitzpatrick agent, 170 ounces; the Black Hawk Company, 216½ ounces; the Cook Gold Mining Company, 25 ounces; Geo. T. Clarke & Co., 120 ounces; W. Hussey & Co., 20 ounces; Kountze Bros., about 90 ounces; and a prejudiced individual who refused to have his name or the name of his company mentioned, 70 ounces. We hear of several other small lots, which will bring the total up to about 1,900 ounces. . . . From Clear Creek county the *Register* learns that times in the vicinity of Idaho are looking bright. The Federal Mining Company are building a boarding house, store room, putting in a dam, and making preparations for building an extensive mill. The property is located about one mile below Idaho, on Clear creek. Several prospecting parties have started up Chicago creek to discover the extension of the silver lodes which were struck in Argentine. Considerable excitement is at present manifested in regard to the White river gold mines, which are located in the northwest corner of the Territory, a party of about seventy men having started across the Range for there, and another party being about to start. . . . The Black Hawk *Journal* says: A fire assay was made from a piece of quartz, weighing not more than half a pound, taken from the Vanderbut lode down the creek, at a depth of about twelve feet. The result was as fine as we have ever seen. Gold and silver was obtained to the value of one dollar. The lode was struck last fall, and a new shaft is now being sunk on it, owing to the partly caving in of the old one, which was about thirty feet deep. They have a crevice about three feet in width in the new one.

Illinois.

Mr. Vanelev Phillips, writing from Dubuque, Iowa, June 8th, says: "Ten miles south of Galena is what is known as the New California Diggings. The ore is here found at the water level of the Mississippi, and works under a bluff of limestone some 200 feet high. These mines are worked in the winter, and, when the Spring rise comes, are filled with water about Fairplay are all in east and west crevices—these cutting down vertically through the limestone, the ore standing in the fissures in the form of east and west vertical "gash" veins. Some of these crevices have been followed over a mile in length, the ore becoming of a larger type and deeper in the crevice at one end, and passing in wet grounds where the crevice has been abandoned. At Hazel Green the lead ores make in three distinct character of veins—vertical sheets, of veins hard in the limestone, and from half an inch up to two inches thick. These veins occur in patches, known to miners as "sheet lots," the veins, being 10, 20 and 50 feet apart, and crossing each other at right angles. Sometimes the north and south vein will be the master, and cut out the east and west; again the east and west will have the most force, and cut out the north and south; again the influence will be equal, and each vein hold its course, and average quantity of ore. The miner follows this ore by sinking a shaft, and then cutting out the ore, with a long handled narrow pick, and, then blasts off one of the wall rocks, so as to give him room to advance and again cut out the ore. These veins are generally followed by Cornish men, the native miner not having the patience to remove so much rock to get the ore. Here are also a large class of east and west "gash" veins; also considerable quantities of ore were originally washed from the clay, and made in what the miners call "clay diggings"—that is, ore in a bed over the surface of the rock. At Porter's Grove, in early times, the lead ores were worked in "open cuts," much the same way as the brown hematite iron ores are worked in Pennsylvania and other iron districts; the cut was commenced along the slope of a ridge, and a cart backed up, and the surface earth removed, and the ore which lay in the form of an east and west vein in the clay mined. This class of ore was always found to belong to fissures in the lead measures, and was the outcropping ore, and generally followed until the ore concentrated in a vein in the rock, and was worked to the water level and then abandoned. At Mineral Point the first discovery of

lead veins was made by bald spots on the sides of the ridges, known to miners as "dry-bone blazes." In these places the soil was filled with zinc ore, known as "dry-bone." Imagine a country traversed by ridges formed of limestone in nearly horizontal strata, the ridges being 200 feet altitude above the creeks, which are about one mile apart, and are fed by springs which break out of the rock, and run clear rippling streams over gravel and rocky bottoms—these ridges terminating in numerous points or arms, and being covered with clay from five to ten feet deep—the contour of each ridge and little arm or point, being rounded off as if each ridge, with its branches, was a part of some great system, like a section cut from the branches of a tree, or streams laid down on a township map. We see the streams all tending to one point, and suppose there must be some parent stream. So with those ridges—the smallest point or arm connects with a larger dividing ridge, this with a still larger, and this can be followed to the Platte Mounds, three conic hills, 20 miles distant, that rise 300 feet above the valley of the lead field, and are the centre of the ridge system, which, like so many lambs, radiate to all parts of the lead field. Along the sides of these ridges about Mineral Point, low down near the water-courses, lead mines will be found. These are in what miners call "flat openings," the lead ore being found in chunk form in a matrix of clay and other between the strata of limestone. Higher up another level of ore is found. The ore here is more in the form of "pipe" veins, that is, veins penetrating the hills through round chambers in the rock, from whence is derived the name of "pipe vein." Still higher, and on the summit of the ridges, the ore is found in another type of veins, known as vertical "gash" veins, from the fact that the ore is limited to certain strata of limestone, and occurs in parallel fissures, running east and west, like so many gashes cut down through the rock. To get a more practical idea of these ridges, we will go in a brick-yard and take some well-ground clay, and roll out a sheet an inch thick, like a pie-woman rolls out her crust, and lay this down across two round sticks, which may be two inches in diameter and one foot apart; we will call this layer the upper sandstone; another layer an inch thick, which we call the blue limestone; another layer an inch thick, which we call the lower Galena limestone; another layer one inch thick, which we call the upper Galena limestone; above this a half-inch layer, named the cap-rock. Here we have a pile or table of rock, such as the lead measures were prior to the formation of the valley and ridge system of the lead field. We must now attempt in a way to make a ridge, and take a penknife and commence to chip out the clay along the two parallel sticks; we cut out first a rough channel down through the three upper layers and half way through the fourth, which we named the sandstone. The next work is to round off this mass of clay until a scrap of the upper strata or cap-rock only is left. Here we have the rough frame-work of a ridge. Now the fissures and chambers, where the lead ore is to be filled in; first, we cut some three parallel fissures down near to the bottom of the upper Galena limestone, and fill them up with black sand; then lay the pieces of cap-rock in their former place; second, we take a pipe-stem and perforate the clay in a nearly horizontal line along the sides of the ridge, about one-sixth of the way through, and fill these pipe-boles with black sand; third, we cut horizontally at two levels in the layer named the blue limestone, about one-sixth of the way in the pile, and fill these with black sand. We have now the three types of veins filled in the sides and top of the ridge, and roll out a sheet of clay a quarter of an inch thick and cover the mass (which represents the clay covering the ridge), and we have in miniature a rough outline of the way the lead ores lie in their matrix of limestone about Mineral Point, before being attacked by the pick of the miner. Extend this system of ridges along indefinitely, the lead measures going lower and rising higher above a base line. The water courses follow along when the strata has been raised. You will notice that the creeks follow along where the sticks lay, which may be compared to the elevating forces, and our little clay strata have a slight dip toward the center of the ridge. The country is formed in a series of basins. The study of the filling or repletion of the veins in one of these basins is the key to all the others.

Virginia.

EDITOR JOURNAL OF MINING:—Sir: Without recounting the geological structure of the belt of country lying between the Eastern Range, or Blue Ridge, of the Alleghenies and tide-water, it is sufficient to know that the eastern edge of this belt is traversed by veins, or leads of gold-bearing quartz rock, in width from one to fifty feet, and of an unknown trough, often cropping out in a nearly northeast and southwest course for miles. For a long period of years, placer mining, with pan and rocker (as well as at the present time), has been carried on in this section. About twenty years ago the Eagle mine, near United States Ford on the Rappahannock, was discovered, and was soon worked with machinery. New discoveries were made and machinery put to work crushing the quartz, till, when the war of rebellion broke out, there were eight or ten extensive mines in operation, worked by the most improved machinery—if not in the most improved manner as regards the mining department—all located within a few miles of the Eagle mine. As the contending armies swayed to and fro through Virginia, this mining section often came in the direct line of march, and was quite as often the scene of bloody contests, as the fallen timber, hastily constructed earthworks, and sunken burial pits fully attest. Like all other property, that of the mines suffered great damage at the hands of the soldiers and the thieves who had been plundering the works of almost every movable thing since the war. Some of the works have been burned, nearly destroying the stamping or pumping and hoisting engines; most have been stripped of the outside covering, doors and windows, and the laborers' tenements have been pulled down; the cribbing of the shafts has been burned or has rotted away, and, in fact, ruin meets the eye on

every hand. The mines lost many tons of good quartz, carried away as specimens by the soldiers; cart loads would disappear in a single day of the kinds that showed the glittering pyrites or sulphates. The Eagle mine was kept in operation till July 1862, although their powder was taken away by the rebel authorities in the summer of 1861, which compelled them to abandon working in the main shaft and drift. They then opened the vein where it cropped out, a half a mile to the north, and worked it till the final stoppage. I was not able to learn much of the workings of the mines, and could judge only by what is to be seen above ground. The Eagle mines ran 24-stamps and two Chilian mills. The pumping and hoisting was done by an engine of about 75 horse-power; the works are now in ruins. On the south side of the river and seven miles from Fredericksburgh, is the Mott mine; it was abandoned some years before the war. I was told that the vein ran out or was lost in a fault. The mill is in ruins, although the engine, etc., yet remains. Following up the north side of the Rappahannock river, two miles from Elis' ford is the Liberty mine. It was worked by an engine of near 200 horse-power, of the best construction, as was also the other machinery. The buildings and machinery have been stripped of all the small parts. They worked 24-stamps and two Chilian mills, besides some other mills which had been abandoned. The vein runs in a northeast and southwesterly course, and has been opened on the surface about 500 feet. I could not learn that there had been any shafts sunk, but was told that the works stopped in 1858-9; the reason why, I was not able to ascertain. About two miles to the northeast is the Wyckoff mine, apparently on the same vein as the Liberty. The vein was worked by several shafts, and by an engine independent of the stamping-mill, which is a fourth of a mile west of the vein; it was operated by a very fine engine of about 250 horse-power, 24-stamps were used, which were given a revolving motion with the drop; two Chilian mills, as well as a general assortment of crushing, or pulverizing mills, that had been thrown aside. The building and engine has been stripped of all that was portable by a "man." If there were other buildings than the mill and farm house on the property, they have disappeared. The works were stopped in 1861. The Franklin mine is a mile and a half from the Wyckoff, and supposed to be on the same vein. They are yet in as good condition as when they stopped in 1861, except the natural decay. The main shaft was sunk about 100 feet and a drift carried along the vein near 300 feet. Attached to the stamp-mill is a saw and corn mill. Crossing the Rappahannock by Elis' ford, at which point there is a very fine water power and a very fair mill, and the Rapidan, by Wyckoff's ford, the first mine is the Malvern. The vein crosses the river at nearly right angles to its course. Hills about 175 feet high rise from either side of the river, the vein cropping out on the top. There is 14 feet fall in the river near this point, furnishing abundant power to stamp the quartz, which was the manner of working the vein when it was first opened from the river by a drift, allowing the water to flow out of the mine, and the rock to run in cars by its own weight. This manner of working the mine was abandoned. An engine and works were erected on the highest point of the hill, a shaft was sunk, making it necessary to hoist all of the rock and water, and to clear the property of timber for fuel, in place of using the water that costs nothing! It is evident that this mine possesses superior advantages for working to any of the others. The buildings, etc., are in good condition, except the natural decay. The mine was worked up to 1862, when Wyckoff was taken a prisoner by the rebels to Richmond. On the north side of the river is the site of the Culpepper mine. It was abandoned some years before the war—why, I could not ascertain. Half a mile south of the Malvern mill is the Vaclver, which is likely on the same vein. Its course is nearly northeast and southwest, and varies in width from ten to fifty feet. The main shaft was worked with a large walking-beam engine. The buildings were burned during the war, badly damaging the engine, pump connections, etc. Near the main shaft the vein was worked from the surface. At this point the vein is fifty feet wide. A circular pit was dug sixty feet deep and near two hundred wide at the surface. On its sloping side was a winding road, up which the quartz was carted. To the south was another vein shaft, worked by a whim. The stamp works, etc., are situated a fourth of a mile to the east, and was run by a large and very good engine, that is, three sets of six stamps each, as well as two Chilian mills, with a large assortment of grinding mills that have been abandoned. Some process for desulphurizing must have been used quite extensively, for there are the furnaces for twelve pans remaining. The engine and works have been badly damaged, yet the laborers' dwellings, the boarding house, and the superintendent's house have suffered very little damage. The mine was worked up to, and a portion of, the year 1862. A mile south is the Ambler mine property, through which passes the plank road. The works are in ruins, and were abandoned some years before the war. I was told that it was not possible to keep out the water and quicksands. At this point commenced the battle of the Wilderness. Here is the north end of the hastily-constructed works, made of logs, earth and brush. At Appomattox Court House, at some points, the line is straight, then again curved in or out, or making an angle to the right or left, over hills, across ravines or streams. The ground is yet strewn with the debris of battle, but soon all signs of the graves will be obliterated. The quartz veins are easily traced from this point in a northeasterly course to the Potomac river near Georgetown. Much of the soil is quartz rock, pebbles and sand, without fertility, much broken with abrupt hills, and mostly covered with woods, much of it of ancient growth. Little of the land is cleared; for it lays midway between the river and railway, and too far from both to pay for transportation of the unmanufactured timber. If the quartz paid a profit to mine at one point it will likely pay at others; and between the two extremes where it has been worked, there is room for hundreds of mining companies, with abundance of wood and water power.

There is known to be valuable minerals, iron, signs of lead and copper, soapstone, plumbago, etc. The lands can be bought cheap, are lightly taxed, are bordered on either side by as good farming lands as there are in Virginia, and lay at the feet of the northern capitalist; and yet they go and scatter their money in the far West, without looking at Virginia!
ALEXANDRIA, Va., June 13th. E. A. DAYTON.

Idaho.

Owyhee.—The following items are condensed from the *Owyhee Avalanche*, April 28th: Forty men have located ranches on White Horse creek—thirty-five miles southwest of the Owyhee river. . . . A large number are preparing for extended prospecting for many miles around, making Owyhee headquarters. Discoveries are daily reported. The French claim is turning out remarkably well. The present summer will, no doubt, be one of continual discoveries. We are told that wonderfully rich discoveries are kept secret, and neither worked nor claimed for fear of lawsuits—the bane of rich mines. . . . Idle men are becoming scarce, and what few are so, might easily find employment. . . . A number of mill companies are going soon to establish the rule of paying in greenbacks, for the purpose, if possible, to drive dust out of circulation. . . . The Ainsworth mill, on Sinker, is in rather a dilapidated condition. Mr. Leonard, superintendent, is expected to return soon, to overhaul and thoroughly repair all the batteries, pans, and propelling power. Its location at the junction of the main branches of the Sinker, insures water power for ten stamps at least one-half the year. We understand that a new double turbine wheel is to replace the old arrangement, and the steam works will be fitted up also. The company are vigorously prosecuting the work on the surplus ground of the Oro Fino, and have already considerable pay rock out at the mine, and, to facilitate the work, have erected a whim for raising water and rock. All things considered, the Sinker mills have a scene of prosperity not far ahead. . . . The Adriatic ledge lies across at the mouth of Coffee Gulch—one mile west of Silver. Upon an examination, last week, we found a tunnel in the first extension south, and a shaft down twenty feet. In the tunnel the ledge was a mere seam, and at the bottom of the shaft fully six feet wide and increasing very fast. Assays of the rock range from \$28 to \$300 per ton. . . . The N. Y. & O. F. mill is nearly ready to raise steam. It is a ten-stamp, with Varny pans and extra means for saving quicksilver and metal. . . . The Jordan is booming with the melted snow. It interferes with creek mining, but the banks are being ground sluiced down at a rapid rate. . . . Every day business is becoming more lively. The snow is leaving rapidly, and mill and mine owners are shoveling it off where large drifts have accumulated. The Lincoln, Cosmos, and Minear mills will start next week, not to suspend again. Cosmos has been crushing Trook & Jennings rock, and is probably running now. The Oro Fino being the only accessible mines for leucite at present, will supply all the mills. Upwards of forty stamps will be in operation before our next issue. . . . The Morning star mill cleaned up \$14,000 within the past week. This is an 8-stamp mill, the first one built on Jordan creek, in Owyhee, by More & Fagus, in the fall of 1864. On the 8th of March, 1866, as shown by the mill books, it had crushed in 426 days, mining time, 7,369 tons of ore from 7 ledges, and produced of bullion \$1,127,617 39, being an average of over \$158 per ton.

Boise Basin.—A correspondent writing from Idaho City says: "Times are brisk in the Basin. Returns from the sluices are numerously reported at from \$2,000 to \$15,000 a week; every available inch of water is being used on the hills and in the gulches. The creeks are yet too high to be worked advantageously, but the surplus water is fast running off. . . . The White Boys' claim on Bannock Bar cleaned up, on Saturday last, over \$24,000. This don't look as though Boise had played out. Wages are \$7, and laborers scarce at that."

Georgia.

Correspondence from Augusta, Georgia, states that the gold mines at Dahlouega, Georgia, are about to be worked with improved machinery.

Oil Summary.

Illinois.

The Charleston (Ill.) *Courier* says: The Charleston Petroleum and Mining Company, who are now boring a short distance north of town, struck oil in small quantities, the latter part of last week, at a depth of 110 feet. They first came to a strata of slate, then a thin vein of stone coal, and at last accounts were boring in limestone. When they get through the latter, oil is expected to flow in abundance.

Maine.

Several oil springs have been found near Parker's Head, in Maine, on the farm of one Samuel D. Reed. Besides this, he says that coal is constantly being broken off from some coal ledge in the sea and being washed ashore. This coal is bituminous, and will blaze by holding a candle against it.

California.

The Napa *Register* notices a curious discovery at the head of Capel Valley, about fifteen miles from that place, a ledge of white quartz, in which are small cavities containing petroleum—a spoonful or so in a place—here and there imbedded in the solid rock. A company, called the Aladdin Petroleum Company, has been formed for the purpose of prospecting.

Ohio.

The *Oil News* states that a gentleman lately returned from a visit to Muskingum county, Ohio, represents the oil excitement as being intense, and not without

cause. He thinks it is likely to become one of the most productive petroleum regions in the State. At the village of Rural Dale, about fourteen miles south of Zanesville, nine wells have recently been bored, and only one proved a failure. Other wells are on the point of construction. The pumping thus far has been by means of the spring-pole and treadle, but the yield is comparatively large. Steam engines will be substituted as

soon as the roads are in better condition. The oil is of a very heavy gravity, and sells at \$30 per barrel.

Pennsylvania.

From the Venango oil field we hear of continued improvement. Oil capitalists are going to work with renewed courage, and consequently we hear of increased productions. The developments on Blenheim

Run seem to be the most satisfactory—although elsewhere there is no lack of good news.

Kentucky.

The Glasgow Times says: Every well on Beaver creek has thus far been a success in this, that they have produced oil. It has yet been in small quantities, it is true, but still there has been a failure in no instance.

GOLD.

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

LEAD.

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

SILVER.

COMPANY.	SHARES.	STOCKS.	LOCATION OF PROPERTY.	SEC'Y AND PLACE OF BUSINESS.	COMPANY.	SHARES.	STOCKS.	LOCATION OF PROPERTY.	SEC'Y AND PLACE OF BUSINESS.
Amazon	25,000	\$250,000	Nevada	W. I. Louthier, 134 So. 3d, Phil.	New York	1,500	1,500,000	Austin, Nevada	S. R. Hutchinson, 80 B'way N. Y.
Argentine	50,000	250,000	Argentine Dist., Colorado	D. L. Demmon, 134 State, Boston	New York	50,000	5,000,000	Gold Can. Dist., Lander Co. N. Y.	10 Pine street, New York.
Arizona	100,000	1,000,000	22 m W of Tubac, Arizona	J. B. Rantoul, 25 Nassau, N. Y.	New York	50,000	5,000,000	do. do. do. do. do. do. do.	S. A. Hopkins, 71 Broadway N. Y.
Astor	200,000	1,000,000	On Comstock Lode, Nev.	J. Chapman, 71 Broadway, N. Y.	New York	10,000	1,000,000	Nevada	J. J. Osborn, 30 Pine street, N. Y.
Atlantic & Pac.	50,000	1,000,000	Humboldt T. Hum't Co. Nev.	J. N. Sewall, 8 Broad st., N. Y.	N. Y. & Owyhee	10,000	1,000,000	Owyhee Co. Idaho	6 Pine street, New York.
Big Smoky	20,000	600,000	smk'y Hill, Lander Co. Nev.	71 B'way	N. Y. & Orofino	10,000	1,000,000	do. do. do. do. do. do. do.	137 Broadway, New York.
Black Eagle	7,000	350,000	Carson, Owyhee co. Idaho	O. D. Gardner, 40 Maiden lane.	Peak	20,000	2,000,000	Nye County, Nevada	R. C. Root, 74 Broadway, N. Y.
Bullion	200,000	1,000,000	Bannock, Montana	55 Liberty street	N. Y. & Santa Fe	20,000	2,000,000	Nevada	New York.
Bush	50,000	500,000	Austin City, Nevada	176 Chambers st., N. Y.	N. Y. & Washoe	50,000	5,000,000	Nevada	New York.
Combination	5,000,000	50,000,000	Cedar Hill Nevada	J. W. Stoute, Jr., 155 B'way, N. Y.	North Am. M'g	50,000	5,000,000	Nevada	Philadelphia.
Colorado Con.	30,000	3,000,000	Austin City, Nevada	J. E. Smith, 10 Pine street, N. Y.	Ocean Transit	1,500,000	1,500,000	Lower California, Mexico	21 Pine, N. Y.
Columbia	120,000	1,250,000	Averill, Churchill Co. Nev.	49 Liberty street, N. Y.	Ophir	50,000	5,000,000	On Comstock Lode, Nev.	26 Pine, N. Y.
Conn. & Nevada	200,000	2,000,000	Gold Hill, Nevada	78 B'way, N. Y.	Pah Ranagat Cl.	50,000	5,000,000	do. do. do. do. do. do. do.	26 Pine, N. Y.
Commonwealth	200,000	2,000,000	Gold Hill, Nevada	78 B'way, N. Y.	People's	100,000	500,000	Alpine & Sierra Counties	8 Pine street, New York.
Cosmos	10,000	100,000	Owyhee Co. Idaho	137 Broadway, N. Y.	Phoenix	200,000	2,000,000	Arizona	48 East 28th street, New York.
Del Norte & S'br	5,000	500,000	Lower California	New York.	Fine Mount'n	30,000	3,000,000	Fine Mount'n Dist. Nev.	T. H. Perkins, New York.
Durango	100,000	1,000,000	Bannock City, Montana	W. R. Garrison, 73 W'm't., N. Y.	Pioneer & Inskip	50,000	5,000,000	do. do. do. do. do. do. do.	F. K. McCully, 100 B'way, N. Y.
East Bannack	100,000	1,000,000	Bannock City, Montana	J. Callender, 49 Ex. P., N. Y.	Prescott	50,000	2,500,000	Arizona	15 Nassau street, New York.
Empire G. & S.	100,000	1,000,000	Bodie Bluff, Mono.	H. R. Gates, 101 Broadway, N. Y.	Presidential	125,000	2,500,000	Austin, Nevada	Wm. Lemmon, 17 Broad, N. Y.
Empire and Silver State	20,000	2,000,000	Reese River Dist., Nevada	57 B'way, New York.	Republic	15,000	1,500,000	Amador, D Lander Co. Nev.	67 Ex. Place, New York.
Eldorado	500,000	2,500,000	San A 90 m s of Austin, Nev.	208 South Fourth street, Phila.	Revenue Exten.	50,000	500,000	Lander County, Nevada	W. L. Kite, 142 South 4th, Phila.
Essex & Diadem	125,000	2,500,000	Sierra dis, Humboldt C. Nev.	A. R. Wetmore, 81 Vesey st. N. Y.	Rosario & Carmo	5,214	1,480,000	Simont, Mexico	San Francisco.
Franklin	200,000	1,250,000	do. do. do. do. do. do. do.	Philadelphia.	San Antonio	60,000	3,000,000	Arizona	C. Lounso, 21 Nassau st., N. Y.
Gem	200,000	1,250,000	do. do. do. do. do. do. do.	H. K. Gates, 191 B'way N. Y.	Seminole	7,000	1,500,000	Unions, Humboldt Co. Nev.	L. G. Wilkin, 119 B'way, N. Y.
Globe	100,000	500,000	Austin, Nevada	J. W. Bringer, 26 Pine, N. Y.	Stas Wright	60,000	600,000	Amador, D Lander Co. Nev.	18 Wall street, New York.
Good Hope	20,000	1,000,000	40 m s of Austin, Nevada	80 Broadway, N. Y.	Silver Hill	40,000	1,000,000	Nevada	J. C. Hitecock, 62 B'way, N. Y.
Huron	300,000	3,000,000	Montano	New York.	South Series	1,000,000	1,000,000	Lander Co., Nevada	W. B. Rogers, 117 B'way, N. Y.
Lucas	300,000	3,000,000	Stuamit co., Colorado	J. P. Whitney, 19 Lindall, Bost.	Silver Hill	200,000	2,000,000	Alturas Co., Idaho	A. M. Palmer, 19 Broad st., N. Y.
Kuickerbr' and Nevada	20,000	2,000,000	Union Dis. Nye Co. Nev.	H. R. Shotwell, 70 Cedar, N. Y.	Star Hill	20,000	1,000,000	do. do. do. do. do. do. do.	135 B'way.
Lauder Hill	20,000	2,000,000	do. do. do. do. do. do. do.	74 B'way, New York.	Star Hill	20,000	1,000,000	do. do. do. do. do. do. do.	Camastota, New York.
Lucifer	1,000,000	10,000,000	Owyhee Co. Idaho	80 Broadway, N. Y.	St. P. Crk	50,000	1,000,000	18 m E of Ft. Filmore	A. S. Kellogg, 22 Pine, New York.
Low'r California	40,000	2,000,000	North Part of Lower Cal.	55 William street, N. Y.	Stephenson	20,000	2,000,000	Gold Can. Lander Co. Nev.	10 Pine, New York.
Madison	30,000	3,000,000	Nevada	W. W. Perkins, 71 B'way, N. Y.	Strepco	20,000	2,000,000	do. do. do. do. do. do. do.	New York.
Macedon	30,000	600,000	do. do. do. do. do. do. do.	Philadelphia.	Stirling City	12,000	1,200,000	do. do. do. do. do. do. do.	New York.
Manhattan	30,000	600,000	do. do. do. do. do. do. do.	57 B'way, New York.	Tarshish	12,000	1,200,000	Toryabee Range, Un. D., Nev.	H. S. McGillem, 78 B'way, N. Y.
Merchants	30,000	600,000	Alturus Co. Idaho	157 Broadway, N. Y.	Tempest	200,000	1,000,000	do. do. do. do. do. do. do.	I. Bangs, 17 Nassau, N. Y.
Metropolitan	15,000	1,500,000	Austin City, Nevada	158 Broadway, N. Y.	Trumfo	50,000	500,000	San Antonio, Lower Cal.	J. M. Brown, 157 B'way, N. Y.
Morning Star	5,000	5,000,000	Owyhee County, Idaho	137 Broadway, N. Y.	Unjon & El Dor.	100,000	1,000,000	Merger Silver Mt'n	40 Park Row.
Mount Vernon	500,000	5,000,000	Mount Vernon & Mammoth District, Nevada	New York.	Upper Missouri	21,000	210,000	Amador Dist., Nevada	107 Broadway.
Mount Vista	50,000	500,000	do. do. do. do. do. do. do.	J. Chapman, 71 B'way, New York.	Volsler	21,000	210,000	Amador Dist., Nevada	J. G. Bingham, 80 B'way, N. Y.
National	15,000	1,500,000	Owyhee Co. Idaho	115 Broadway, N. Y.	Wanba Yuma	600,000	6,000,000	Arizona	35 William street, New York.
Nevada	100,000	1,000,000	Mountain Wells, D. Ch. Co. Nev.	323 Walnut street, Phila.	War Eagle	50,000	200,000	Owyhee Co., Idaho	G. M. Eldridge, 144 S. 4th, Phil.
Nevada	120,000	1,200,000	do. do. do. do. do. do. do.	E. L. Bolles, 74 B'way, N. Y.	Washington	22,500	2,250,000	Austin, Nevada	S. R. Hutchinson, 80 B'way, N. Y.
New York & Lone	20,000	2,000,000	Lone City, Nye Co., Nev.	71 Broadway, N. Y.	White Mountain	20,000	2,000,000	do. do. do. do. do. do. do.	111 Broadway, New York.

COPPER.

COMPANY.	SHARES.	CAPITAL.	SITUATION OF PROPERTY.	SEC'Y. AND PLACE OF BUSINESS.	COMPANY.	SHARES.	CAPITAL.	SITUATION OF PROPERTY.	SEC'Y. AND PLACE OF BUSINESS.
Adventure	20,000		Paris of Sections 3a, 3b, T. 51, N Range 38 W.	W. H. Smith, 51 Ex. Pl. N. Y.	Lafayette	20,000		Secs. 25, 30, 36, T. T. 51, N. R. 43, and 44, W. Ontonagon.	P. C. Blaccon, 35 Wall St., N. Y.
Etna	20,000		1226 A in Secs. 6, 7, 18, T. 58, N. R. 25, W. Keweenaw co. Mich.	B. A. Hoopes, 324 Walnut St. Phil.	Lyster	200,000	\$400,000	Township Nelson, Canada East.	H. W. Nelson, 24 City Ex. B's't'n
Alb'ny & Bost'n	20,000		Secs 7, 8, 9, 10, 11, T. 55, R. 33	Fred. Beck, 43 City Ex. Boston	Lower California	40,000	2,000,000	N. part of Lower California.	55 William St., N. Y.
Amite	20,000		DeWarte co., California.	8 Wall St., N. Y.	Madison	20,000		Secs. 9, 19, T. 48, N. R. 4, W.	J. T. Waters, New York.
Alzough	20,000		W 1/2 S. 30, T. 51, R. 37.	L. W. Clark, Boston.	Maudan	20,000		680 A. Secs. 8, 17, 19, 30, T. 58, N. R. 29, W., Keweenaw co., Mich.	B. A. Hoopes, 324 Walnut, Phil.
Alouez	20,000		Town 57, R. 32, Sec. 31.	Horatin Bigelow, Boston.	Manhattan	20,000		W 1/2 Sec. 11, NW 1/4 Sec. 14, T. 58, N. R. 32, W. 350 A.	J. W. Davies, 21 Nassau St., N. Y.
Amy g'd'yd'l.	20,000		E 1/2 Secs. 16, 21, T. 58, R. 30.	F. H. Womrath, 324 Walnut St. Philadelphia.	Mendotta	100,000	500,000	SW 1/4 Sec. 7, T. 50, N. R. 38, W.	M. Taylor, 30 Wall St., N. Y.
Arcadian	20,000		NW 1/4 Sec. 20, T. 57, R. 33.	C. P. Dixon, 48 Pine St. N. Y.	Mass. M. Co.	20,000		NE 1/4 Sec. 24, T. 55, R. 34.	J. M. Cooper, Pittsburg.
Astor	20,000		NW 1/4 Sec. 5, T. 57, R. 31.	W. Boardman, 35 Court St. Boston.	Melones & Stan.	20,000		Sec. 15, T. 50, N. R. 39, W.	J. M. Mills, 284 Pearl St., N. Y.
Atlas	20,000		NE 1/4 of E 1/2 & NW 1/4 of NW 1/4 Sec. 31, T. 57, R. 31.	L. W. Clark, Boston.	Minnesota	20,000		Sec. 15, T. 50, N. R. 39, W.	J. M. Mills, 284 Pearl St., N. Y.
Aztec	20,000		W 1/2 Sec. 31, T. 51, N. of R. 37.	L. W. Clark, Boston.	Maryland	20,000		NW 1/4 Sec. 34, T. 51, R. 38, W.	J. M. Mills, 284 Pearl St., N. Y.
Bay State	20,000		SW 1/4 Sec. 29, T. 58, R. 31.	L. W. Clark, Boston.	Merrimac	20,000		Sec. 16, T. 50, R. 39, W. 1,988 A.	J. M. Cooper, Pittsburg.
Beaver	20,000		NE 1/4 Sec. 32, T. 58, R. 31.	A. W. Boardman, Boston.	National	20,000		Keweenaw Point, Michigan.	W. F. Hardy, 27 City Ex. B's't'n
Bohemian	20,000		E 1/2 Sec. 31, NW 1/4 Sec. 32, T. 51, R. 37, W.	R. H. Richard, 21 Nassau St., N. Y.	Nashua	50,000	100,000	320 A. N. Ontonagon.	S. W. J. Webb, 54 Wall St., N. Y.
Boston	20,000		Bromo co., Canada East.	H. W. Warren, 69 City Ex. B's't'n.	Nebraska	20,000		NE 1/4 Sec. 12, T. 50, and other lands.	G. S. Frost, Detroit.
Canada	100,000		T. 51, N. R. 43, W. 8 1/2 of N. of Sec. 14, and E 1/2 Sec. 23, and NE 1/4 Sec. 23, 440 A.	W. H. Abel, 70 Wall St., N. Y.	Nequakett	20,000		Sec. 26, T. 51, R. 43.	H. W. Frost, Detroit.
Carp Lake, M.	20,000		SW 1/4 Sec. 9, T. 49, N. R. 39.	G. F. Riley, 35 Wall St., N. Y.	New York	20,000		240 A SE 1/4 Sec. 10, E 1/2 NE 1/4 Sec. 15.	H. W. Frost, Detroit.
Cascade, M.	20,000		W. in Ontonagon co., Mich.	H. M. Thompson, Missouri, Mo.	New Burma	100,000	1,000,000	New Jersey.	R. Roberts, 19 Nassau St., N. Y.
Copper Creek	1,000	\$100,000	Missouri.	H. M. Thompson, Missouri, Mo.	New Jersey Con.	100,000		Harrison, Bergen co.,	W. Bowes, 68 Wall St., N. Y.
Copper Falls	20,000		Sec. 14, T. 58, N. R. 31, W. Keweenaw Point.	97 State, Boston.	N. Y. & Passaic	100,000		New Devon.	T. H. Belt, Jr., 23 William St., N. Y.
Copper Harbor	20,000		S 1/2 Sec. 10, T. 58, R. 28, 320 A, Keweenaw co.,	Fred. Beck, 43 City Ex. Boston.	New Devon	100,000		North Western.	T. H. Belt, Jr., do. do.
Copper Creek, Central	20,000	500,000	Douglas co., Wisconsin.	T. B. Lawson, 71 Broadway, N. Y.	North Western	20,000		W 1/2 Secs. 24, 25, 26, E 1/2 Secs. 36, 35, T. 58, N. R. 31.	J. M. Cooper, Boston and Detroit.
Cornwall	20,000	500,000	E 1/2 Sec. 29, T. 58, N. R. 31, W. Strafford, Orange co., Vt.	J. Stanton, Jr., 25 Nassau, N. Y.	Norwich	20,000	500,000	Secs. 11, 12, T. 40, N. R. 39, W. and other lands, 1,300 A.	P. C. Blaccon, 35 Wall St., N. Y.
Continental	200,000	500,000	Martinsburg, New York.	D. H. Whitney, 17 State St., B'n.	Ogema	20,000	500,000	NW 1/4 Sec. 6, T. 50, N. R. 33, W.	G. E. Lellogwell, 7 Pine, N. Y.
Cornith	20,000	500,000	Cornith, Orange co., Vermont.	J. Sackles, 50 Ex. Pl. N. Y.	Ontonagon	20,000		631 A Secs. 20, 21, 28, T. 50, N. R. 39, W. Rockland.	G. Hart, 11 Pine Street, N. Y.
Copper Hill	20,000	500,000	Wisconsin.	W. A. Cleveland, 191 B'way, N. Y.	Ontonagon, Mass.	20,000		Ontonagon.	William D. Williams, Michigan.
Decatur	20,000		Sec. 35, T. 55, R. 34, Portage Lake.	J. M. Cooper, Milk St., Boston.	Ontonagon, Penn. Manuf'g.	20,000	1,000,000	4,320 A. Secs. 13, 14, 15, 24, 1/2 Secs. 16, 11, 12, 25, 25, T. 58, N. R. 39, W.	C. Windsor, 69 Wall St., N. Y.
Delaware	20,000	500,000	Ontonagon co., Mich.	S. M. May, 326 Walnut St. B's't'n.	Pewabic	20,000		W 1/2 Sec. 25, T. 55, N. R. 34, W.	S. M. Day, 326 Walnut St., Phil.
Derby	20,000		800 A.	P. C. Blaccon, 35 Wall St., N. Y.	Pitts & Boston	20,000		TS 58, 57, N. R. 31, 32, W. 12,465 A.	C. Emery, 39 State, Boston.
Dorchester	20,000		E 1/4 Sec. 30, T. 55, R. 3.	31 and 32 City Ex., Boston.	Portage	20,000		SE 1/4 Sec. 13, T. 55, N. S. 31, W.	H. A. Johnson, Pittsburg.
Douglas	20,000		Sec. 29, T. 55, R. 3.	S. J. Edwards, William St., N. Y.	Portage Lake	20,000		Houghton Co., Michigan.	C. Emery, Killeby St., Boston.
Dudley	20,000		H. Bigelow 43, City Ex. Boston.	H. Bigelow 43, City Ex. Boston.	Prescott	100,000	1,000,000	Central Arizona.	22 William St., N. Y.
Eagle River	20,000		T. 58, R. 31, Secs. 28, 29, 33, 34.	Ernest Sacchi, 82 B'way, N. Y.	Providence	20,000	500,000	240 A. in Keweenaw co. NW 1/4 Sec. 10, W 1/2 NW 1/4 Sec. 10.	69 Broadway, N. Y.
Ely	100,000	500,000	325 A, Richmond, Canada East.	J. S. McMullin, 423 Walnut, Phil.	Phila. & Boston	20,000		T. 57, R. 32, W.	J. W. Davis, 21 Nassau St., N. Y.
Empire	20,000		1798 A, Secs. 1, 2, 11, 12, T. 58, N. K. 28, W. K'w'n co., Min.	H. Shurley, 137 B'way, N. Y.	Phila. & Boston	20,000		640 A. Sec. 14, T. 58, N. R. J. S. McMullin, 423 Walnut St.,	28 W. Keweenaw co. Mich.
Eureka	20,000		W 1/2 Sec. 2, T. 49, N. R. 41.	F. W. Capen, 44 Ex. Pl. N. Y.	Quincy	20,000		Sec. 26, T. 54, N. R. 34, W.	W. H. Smith, 51 Ex. Pl. N. Y.
Evergreen Bluff	20,000		NE 1/4 Sec. 6, T. 50, R. 38.	F. W. Capen, 44 Ex. Pl. N. Y.	Republic	8,000	200,000	Secs. 21, 22, 27, T. 53, N. R. 28, W., 19,785 A.	H. Baldwin, 70 Wall St., N. Y.
Flint Steel R.	20,000		Sec. 11, 12, T. 50, N. R. 39, W.	F. K. McCully, 157 B'way, N. Y.	Reliance	20,000		Sec. 25, T. 51, R. 38, W.	H. K. Thomas, 11 Wall St., N. Y.
Forest City	20,000		320 A. NE 1/4 Sec. 36, and SE 1/4 Sec. 25, T. 51, R. 43						

AMERICAN Journal of Mining.

[ILLUSTRATED.]

GEORGE FRANCIS DAWSON,
EDITOR.

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NEW YORK, SATURDAY, JUNE 23.

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VETO OF A MINING AND MANUFACTURING BILL.

The President's veto of the New York and Montana Iron Mining and Manufacturing Co.'s Bill, has given rise to much comment, generally approbative. Certainly, while there is much to be said in favor of doing all that in reason can be done toward the development of our country's mineral resources, and especially of the useful minerals in the Far West, yet it is considered by the Chief Executive and his supporters, as impolitic and unwise to approve a bill that would give to a company such extraordinary privileges as does this. It is said that there is some probability of the bill being passed over the President's veto; but we doubt the report. Its provisions authorize the company to pre-empt and take possession of twenty sections of land—three containing iron ore and coal, and the balance timber land near by—conditional on the survey of such land, the construction of iron works capable of manufacturing fifteen hundred tons of iron per annum, and the payment of \$1.25 per acre within two

years from the time the bill goes into effect. The President says that private citizens should have as favorable terms as corporate companies; that private citizens cannot pre-empt beyond one hundred and sixty acres; and where the settlement is upon unoffered territory, the time for payment is limited to the day of public offering. Hitherto, except in the case of coal lands, which have been sold at a minimum of twenty dollars per acre, mineral lands have been carefully reserved from pre-emption and sale. By this bill, the company is to receive a grant, at \$1.25 per acre, that even an individual who has fought for the Union cannot get for less than twenty dollars. In short, the President sums up his objections thus:

First. That it gives to the New York and Montana Iron-mining and Manufacturing Company pre-emption privileges in iron and coal lands on a large scale, and at the ordinary minimum—a privilege denied to ordinary pre-emptors. It bestows upon the company large tracts of coal lands at one-sixteenth of the minimum price required from ordinary pre-emptors. It also relieves the company from restrictions imposed upon ordinary pre-emptors in respect to timber lands, allows double the time for payment granted to pre-emptors on offered lands, and these privileges are for purposes not heretofore authorized by the pre-emption laws, but for trade and manufacturing.

Second. Pre-emption rights on such a scale to promote corporations are unequal and hostile to the policy and principles which sanction pre-emption laws.

Third. The bill allows this company to take possession of land, use it, and acquire a patent thereto before the Indian title is extinguished, and thus violates the good faith of the government towards the aboriginal tribes.

ARRIVAL OF SKILLED LABOR, AND HOW TO INCREASE SUCH IMMIGRATION.

The immigration from Europe to this country appears to be causing considerable disquiet to the employers of labor on the other side of the Atlantic. Until within a short time the class of immigrants had consisted chiefly of unskilled laborers—men skilled in using their muscles rather than their brains. But now our coal mines invite over the South Wales colliers; our copper, silver and gold mines the Cornish men; our iron and steel works the men of Sheffield, and our engine works the men of Lancashire. There is room for as many skilled laborers as are likely to come. The wages here are higher in proportion than in Europe, and such an immigration will conduce to the general advantage of all concerned. The experience of the English, the skill of the French, and the quiet perseverance of the German are desirable elements to mix with the restless energy of our own mining countrymen. But this immigration seems to have commenced, and is now going on in spite of grave hindrances. We want such men to come to this country. Then why do we not incite them to come? Newspaper articles may do something—but not much. Neither these nor immigration hand-bills, but letters from residents here to their friends abroad, are the best immigration agents to employ; yet upon every one of these we lay a tax of 24 cents. Great Britain to her colonies is somewhat wiser, and taxes them only half that amount. Why should a letter cost more to Liverpool, Paris or Hamburg, than to San Francisco? Yet in one case the charge is 3 cents, in the other 24. Let it be read, in constantly arriving letters, in European cottages, that a skilled laborer is sure of high wages and constant work, and his own natural discontent of the present, and hope for advancement, joined to the natural persuasion of those who wish to have their old friends with them again, will do more than all the immigration agents that can be employed.

SUTRO'S MAMMOTH TUNNEL.

We understand that Mr. A. Sutro has gone to Europe to seek from the capitalists of London, the \$3,000,000 needed for the completion of the great adit known as the Sutro Tunnel—which is to run from near Dayton to the Comstock lode, in the State of Nevada, draining the mines at a depth of one thousand feet lower than the lowest point any of them have yet reached. We should have been better pleased to hear that the prosperous silver companies mining the Comstock all the way

from Cedar Hill to beyond Crown Point, had clubbed together and subscribed the requisite amount. There must be from thirty to forty of them; and supposing there are but thirty, it would amount to only \$100,000 each, while each would derive a benefit far exceeding that amount. There is no question but that the Comstock is a true lode—all the scientists are agreed on this point—and that it will not diminish in richness as the workings descend, is generally believed. Why, then, there should have been any hesitancy on the part of these companies to take hold of the Sutro project themselves, is very surprising. Perhaps they differed as to the proportion that each should pay—as some of the Comstock mines (in Gold Hill) extend only ten or fifteen feet on the lode, while others (as in Virginia) extend as many hundreds. But whatever the cause, we may be very sure that British capital will jump at such a chance, and that when the great adit is completed—if geologists are not entirely at fault—there will be gathered a harvest of silver, in contrast with which the \$30,000,000 or \$40,000,000 heretofore realized may be counted only as first fruits.

A RUSH OF RAILROAD BILLS.

It would seem as if the railroad people are having a grand jubilee. Their bills are running through Congress at railroad speed, and so long as they do not ask too much, we feel a sort of sympathetic jolity in the reflection that nearly every scheme comprises a railroad that will open up to development the mineral regions of our advancing country. On the 19th inst. the "Pacific Railroad bill" passed the Senate; also "a bill to grant lands in aid of the construction of a railroad from Salt Lake City to the Columbia River. On the 20th, the bill "to grant land in aid of the Kansas and Neosho Valley Railroad was taken up and discussed; while in the House, the same day, the bill granting to the State of Iowa alternate sections of land to aid in constructing the Iowa Central Railroad was reported back by the Committee; the California and Oregon Railroad Senate bill came up; a substitute for the Senate bill for a grant of lands to the State of Kansas to aid the Northern Kansas Railroad was reported back; the Columbia River and Salt Lake Railroad Bill, and a bill "to amend the Act of July 22d, 1864, to aid in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean," were referred.

A Fine Cabinet

Usually the arrivals from the great mining regions of the Pacific consist either of gold and silver, or of prospectors seeking Eastern capital to develop their mines. But we now are on the *qui vive* for the arrival of a museum of scientific curiosities, consisting of 15,000 or 20,000 specimens of ores, petrifications and native productions, from most of the Western Pacific States, as well as from Mexico, New Granada, Australia, and the islands of the Pacific; also a model of a quartz mill, with stamps, pans, &c., worked by a miniature steam engine, all the woodwork being made from the various indigenous woods of the Pacific coast. The collection has been made by a Mr. M. J. Henley, of Dayton, and is the fruit of his *con amore* study for years past. The specimens are so arranged as to exhibit all needful information respecting the ores.

Good News for Coloradians.

We have good authority for stating that Mr. Herman, representative of the great copper-smelting firm of Vivian & Sons—who have no less than two hundred and fifty furnaces at Swansea, South Wales, hard at work all the time—recently arrived in this city to make personal inspection of some of our American copper ores. Having seen some of the ores from Colorado and tested the same, he pronounced the

results *fabulous*, and on the 14th inst. he left Atchison, Kansas, on his way to that land of buried riches. It seems that he is of the same opinion with Mr. Lyon, and others, that the only true way of reaching the precious contents of Colorado lodes is by smelting.

Sad Loss.

The death of Henry Darwin Rogers, Regius Professor of Geology and Natural History in the University of Glasgow, is severely felt in scientific circles of America. The deceased was a native of Philadelphia, and at various periods filled chairs in American colleges. His official report on the geology of New Jersey, and his geological survey of Pennsylvania, besides his many contributions to leading scientific journals here and in England, will be remembered with pleasure by many of our readers.

"Fair Play is a Jewel."

The New York City Council has concurred with the Board of Aldermen, in directing a contract to be made for lighting the city lamps with coal gas at the present high rates for twenty years. As gas can be made from petroleum at 50 per cent. less cost than from coal, and as petroleum gas burns with a far more brilliant flame, the passage of such an ordinance is manifestly an outrage on the people of this city—and one which we cannot believe Mayor Hoffman will concur in.

Scientific Meetings.

SOCIETY FOR THE ADVANCEMENT OF SCIENCE AND THE ARTS.

Monday evening's paper was on cholera, by Doctor Giseom. Cholera, said he, is like the shears of fate—one blade by itself is comparatively harmless, the two blades together easily sever the threads of human life. The one blade is the choleraic atmosphere—the other blade is filth. On board of vessels, how narrow is the line which separates death from life! He goes down the hatchways, but avoids the cabin stairs. On the one side of a partition is cleanliness, fresh air; and on the other filth, want of ventilation and death. Inquiry has been made as to the character of the immigrants who came over in the cholera ships; the answer was, they were the filthiest that were ever passed by the health officer. And where has Cholera first shown himself in our own city? Not among that travelling part of the community with whom we might expect he would be first introduced, but among persons who seldom stir away from their own squalid homes; not near the wharves, but in the middle of the city, where low-lying, damp, filthy, or over-crowded dwellings invited him. Another curious circumstance of his approach, was the time—in the night. Almost all the cases occurred after sundown; not in the middle of the day. The men who were engaged in removing nuisances were warned of this; those who worked during the day only escaped; those who ventured upon this work after night were frequently attacked. The mortality in this city was, in 1849, one in every hundred of the inhabitants. In Philadelphia, on the contrary, where the inhabitants were better prepared, it was only one in four hundred and fifty.

But, you may ask, how is cholera to be kept at a distance? I answer, chiefly with fresh air. The human lungs require a certain number of cubic feet of fresh air per minute; of this only one-fifth is oxygen, which changes the food into blood and keeps up the vital heat of the body; the remaining four-fifths is nitrogen, a neutral gas so far as is known. When the lungs have made use of this small modicum of oxygen, it is returned to the air a poison—carbonic acid. Here it gets rid of its poisonous nature, and becomes ready again to enter the body. We breathe, in fact, the same oxygen which Adam and Eve, and all who have succeeded them, have breathed; and it is this same oxygen gas which maintains light in a candle. Look

at these candles (putting two under a glass vessel); this vessel represents the hold of a ship; this hole at the top, the hatchway; these candles, human beings; see how dimly they begin to burn; now one is extinguished—dead; it has exhausted its oxygen, and the carbonic acid gas cannot escape through the hatchway; just so with immigrants.

It used to be the practice of the British Government to pay ship owners for taking convicts to Botany Bay, according to the number shipped; the consequence was, fifty per cent. died on the voyage. The government changed the plan, and paid for each immigrant landed; the same number was shipped, but the mortality was only one and a half per cent., or less than the mortality among a similar class on shore, and this effect was produced by introducing ventilation and cleanliness. Next to this is the removal of nuisances, and good drainage; and then, if the infectious matter has been allowed to be formed, the use of disinfectants. Of these, one of the most powerful is chlorine gas, which, when brought directly in contact with the vitiated atmosphere, combines with it, and thus neutralizes it; but it is irritating to the organs of the mouth and nostrils, and therefore not fitted for use among living beings. Chloride of lime and lumps of lime left in a room until they crumble to powder are also excellent, and still better are some preparations recently introduced.

The Doctor then exhibited a round tin apparatus with openings at the bottom, closed at will, like the register of a stove, for applying powders, which he hoped would come into general use. He also exhibited the Archimedean Screw Ventilator, an exceedingly simple and ingenious means for causing a circulation of the air.

Original Papers.

PREPARED FOR THE JOURNAL OF MINING.

GEOLOGICAL SCALE.

SHOWING THE ROCK FORMATION IN WHICH GOLD IS FOUND, IN THE UNITED STATES, CANADA AND NOVA SCOTIA. BY R. P. STEVENS.

Rocks	Geological Age	Localities
Alluvial	Recent	River Sands of California, Oregon, Washington, British Possessions, Idaho, Montana, Colorado, Arizona, New Mexico, Mexico, Nebraska, Minnesota, Atlantic States, Vermont, Canada East, Nova Scotia, Iowa, Illinois, New York, Ohio, Vermont, Canada East, Nova Scotia.
Drift	Past Pliocene	California, Valleys of Sacramento and San Joaquin.
Placer	Past Pliocene (Lacustrine)	Coast Range Mountains.
Tertiary	Cainozoic	Coast Range of Mts. on the east slope, Foot Hills of Sierra Nevada.
Cretaceous	Cainozoic	Sierra Nevada, west slope, Rocky Mts. ? Reese River Mts. ? Humboldt Mts. and others in Nevada. ?
Jurassic	Mesozoic	Sierra Nevada, east slope, Humboldt, Mts., Reese River Mts., other ranges of the Basin.
Triassic	Mesozoic	Sierra Nevada, west slope Rocky Mts. ?
Carboniferous (upper) (Nubius)	Palaeozoic	Nova Scotia. ?
Devonian	Palaeozoic	Montana, Canada East, Nova Scotia.
Silurian	Palaeozoic	Canada E. & W., Wisconsin, Michigan, Vermont, Maine, New Hamp., Nova Scotia.
Quebec Gr'p. in part.	Azoic	Canada E. & W., Maine, N. Hamp., Vermont, Maryland, Virginia, North Carolina, South Carolina, Georgia, Alabama, Atlantic States, Arkansas, Missouri, Minnesota.
Talcose State Group.	Azoic	Canada E. & W., Wisconsin, Michigan, Vermont, Maine, New Hamp., Nova Scotia.
Mica State Group.	Azoic	Canada E. & W., Wisconsin, Michigan, Vermont, Maine, New Hamp., Nova Scotia.
Granite and Quartzoid Group.	Azoic	Colorado, New Mexico, Arizona, Missouri, Wisconsin, Min'ta, Mich. S'th'n Atlantic States, Nova Scotia. ?

[WRITTEN FOR THE JOURNAL OF MINING.]

LEAD FIELDS OF THE UPPER MISSISSIPPI—No. Two.

THE DUBUQUE MINES.

By J. VANLEVE PHILLIPS.

These noted lead mines are a system of parallel east and west gash veins, and occur in the upper galena limestone. The lead measures along the river at this point, rise up in nearly vertical walls, three hundred feet high—the egress from the lower part of the city, and the bottom along the river being through denuded valleys that run west and divide the lead measures in

a series of ridges. These are covered with deep clay, and have numerous small ravines terminating along their sides. The country is prairie, with occasional groves of timber. The creeks that come in from the west follow vallies, cut down nearly to the level of the Mississippi. By this arrangement the lead measures are drained two hundred feet deep along the bluffs, and about one hundred feet back—from one to two miles—where the veins have been united. There have been about seventy-five of these east and west fissures, discovered in a distance of five miles up and down the river. Some of these crevices have been worked one and a-half miles in length, in this distance crossing three or four ridges, and making three or four lodes, or large gash veins—the largest ore being found in the centre of the ridges. Some of these crevices have been worked only at one point; others, again, at two points, one mile apart. The ridges have a similar structure—the upper galena limestone cap rock, and blue shale being above the level of the deep valleys. In sinking on the high grounds back of the city, the succession of strata is as follows: Twenty feet of surface clay, a clean spading alluvial clay, with occasional horizontal layers of water-worn pebbles of yellow and white flint, twenty feet of yellow pipe clay impervious to water, ten feet of blue shale, twenty feet of yellow fine-grained magnesian limestone, known as the cap rock. If the shaft is following a fissure or crevice below the cap, this expands to a width of five, ten, or twenty feet, the space being filled with clay, ocher sand and tumbling rock, which forms the matrix of the lead vein. These expansions of the crevice are called "openings" by the lead miner. The crevice through the cap rock is tight, with occasional round chimneys, cut up through to the clay above, and thus forming sinks in the clay. Where these were found in an east and west range, they were selected by the miner for points to sink prospect shafts, and frequently led to veins in the openings. These openings are from fifty to seventy-five feet deep, and grow narrower towards the bottom. It appears that at one era, these lead measures were fissured vertically, and that the walls of these fissures were then eroded in the upper galena limestone, under the cap rock—the material being partly removed by the action of water, and the space filled with surface clay, and water with pebbles of flint, and afterwards the lead vein filled in this clay and sand which formed the matrix of the ore. Where the material filling these openings has sunk away from the cap, a cave is formed. These caves are sometimes one thousand feet in length, twenty feet wide, and ten feet high, the clay in the bottom being fifty feet or upwards deep. The lead ore is filled in the form of a gash vein through the central part of the clay in the opening, and in places is attached to the roof rock of the cave. In one of these caves, opened in 1852—at which time the examination was made—in the seam in the cap rock was suspended a vein of ore that hung downwards in the cave four feet, and was fifty feet long, one foot thick, cubic formed, and weighed one hundred tons. Along the sides of the roof also, were seen numerous cubic masses of ore weighing tons, among these: stalaectites, and masses of pipe-formed satin spar. The ore hung round the roof of this chamber, or cave, which was eight hundred feet in length, like strings of ivy seen climbing the walls of some deserted mansion. The great mass of the vein was in the clay, going down seventy-five feet below the cave, and to nearly the bottom of the upper galena limestone. At one point along the Mississippi, the lead veins follow these openings out to the face of the bluffs, the ores being first found in the debris at the bottom of vertical fissures seen in the limestones, and were followed in the ridges by drifts. At other points the fissures or openings near the bluffs are barren of ores; some ridges are also more productive in ores than others. In the central part of the ridges, these east and west openings and caves, which are from one to three hundred feet apart, connect by small north and south caves or openings. These are generally about large enough for a miner to crawl through, and sometimes carry small strings of ore in sheet form, in the clay in the bottom, say one-eighth of an inch thick, that lead from one of the large east and west veins to another. A large amount of exploring for these caves is done by the lead miner under this cap rock, and

NEW YORK STOCK MARKET.

Table with columns for Mining companies and dates from June 16 to June 22. Lists companies like Adl Elmore, Atlanta, American Flag, etc.

OIL STOCKS.

Table listing oil stocks such as Bennehoff Run, Buchanan Farm, Central, Excelsior, etc., with prices for various dates.

FREE LIST.

Table listing various oil products and companies under a 'Free List' category, including Bennehoff Run Oil, Brevort, etc.

BOSTON STOCK MARKET.

Reported for the Journal of Mining by Lombard & Co., 99 State Street, Boston.

COAL.

Table listing coal companies and their stock prices for dates from June 15 to June 21.

MINING.

Table listing various mining companies and their stock prices for dates from June 15 to June 21.

PETROLEUM.

Table listing petroleum products and companies, including Beebe Farm, Boston and Kentucky, etc.

New York Companies.

Table listing New York companies and their stock prices for dates from June 11 to June 13.

PRICES OF ASSAYING IMPLEMENTS.*

(CORRECTED WEEKLY.)

Table listing prices for assaying implements such as Smelting Furnaces, Cupelling, Scales, etc.

CHEMICALLY PURE PREPARATIONS

* USED IN THE VOLUMETRIC ASSAY.

Table listing prices for chemically pure preparations like Acid, Acetic, Arsenious, etc.

* These articles can be procured at the stated rates, by sending order, with remittance, to

WESTERN & COMPANY, 37 Park Row.

UNITED STATES SECURITIES.

Reported for the Journal of Mining by Messrs. MEIGS, VON SEYBOLD & CO., No. 4 Broad st., New York.

LOANS.		AMOUNT	RATE	INTEREST	WHEN	OFF.	ASKED
INTEREST PAYABLE IN GOLD.		OUT-	PER		PAYABLE.	PER	PER
		STANDING.	ANNUUM.			CENT.	CENT.
AUTHORIZING ACTS.							
Registered Bonds.	28 January, 1847.	\$9,415,250	6	1867	Jan. July.	125	136
Coupon							
Registered Bonds.	31 March, 1848.	8,908,342	6	1868	Jan. July.	122½	125
Coupon						127½	130
Registered Bonds.	22 June, 1849.	7,022,000	5	1871	Jan. July.	104½	107
Coupon						99	102
Registered Bonds.	14 June, 1858.	20,000,000	5	1874	Jan. July.	102	102
Coupon						99	102
Bonds, March 3, 1861.		1,016,000	6	1881	Jan. July.	106	106½
Registered Bonds.	8 Feb. & 17 July & Aug., 1861.	282,295,500	6	1881	Jan. July.	106	106½
Coupon						102½	103
Registered	25 February, 1862 (5-20's).	514,780,500	6	1882	May Nov.	102½	103
Coupon							
Registered	(5-20's) new issue.	100,000,000	6	1884	May Nov.	102½	103
Coupon							
Bonds, March 3, 1865.	(5-20's)	80,734,500	6	1888	Jan. July.	106½	106½
Registered	(10-40's)	171,219,100	5	1904	Mar. Sept.	96½	96½
Coupon						96	96

Total April 1.

LOANS.		AMOUNT	RATE	INTEREST	WHEN	OFF.	ASKED.
INTEREST PAYABLE IN LAWFUL MONEY.		OUT-	PER		PAYABLE.	PER	PER
		STANDING.	ANNUUM.			CENT.	CENT.
AUTHORIZING ACTS.							
Bonds, Cent'l P. R. Co., July 2, 1864.	6	\$2,362,000 00	1895		Jan. July.		
Bonds, Union P. R. Co., July 2, 1864.	6	2,130,000 00	1895				
Temporary Loan.	4		10 days' notice				
Temporary Loan.	5	124,561,486 00	10 days' notice				
Temporary Loan.	5		10 days' notice				
Certificates of Indebtedness, March 1, 1862.	6	43,025,000 00	1 yr. from date				
1 and 2 Years' Notes, March 3, 1863.	5		3 yrs. from date				
3 Years' Compound Interest (March 3, 1863) Notes.	6	162,012,140 00	3 yrs. from date		At maturity		
3 Years' Treasury Notes, June 30, 1864 (March 3, 1865).	7.3		3 yrs. from date		Aug. Feb.	102½	102½
3 Years' Treasury Notes, March 3, 1865.	7.3	812,221,600 00	3 yrs. from date		June Dec.	102½	102½
3 Years' Treasury Notes, March 3, 1865.	7.3		3 yrs. from date		July Jan.	102½	102½
Aggregate of Debt Bearing Lawful Money Interest.							
April 1.							
							Total Interest

(CONTINUED FROM PAGE 202.)

NAME.	FRIDAY, MAY 25.	SALES FOR WEEK ENDING MAY 25.
Sierra Nevada.	125	276
Imperial.	122	276
Gould & Curry.	730	14
Chollar-Potosi.	390	450
Yellow Jacket.	610	205
Bullion.		145
Crown Point.		145
Belcher.	180	164
Overman.	47	211
Ophir.	350	375
Hale & Norcross.	970	960
Excelsior.	8	240
Savage.	500	830
Empire Mill.	180	160
Alpha.		2
Lady Bryan.		1
Dancy.	19½	20
Confidence.	30	37
Baltimore Amer.		
Central No. 2.	5	2
Kentucky Cop Co.		
Golden Rule.		30

SAN FRANCISCO STOCK MARKET.

LATEST BY MAIL.

NAME.	FRIDAY, MAY 25.	SALES FOR WEEK ENDING MAY 25.
Sierra Nevada.	125	276
Imperial.	122	276
Gould & Curry.	730	14
Chollar-Potosi.	390	450
Yellow Jacket.	610	205
Bullion.		145
Crown Point.		145
Belcher.	180	164
Overman.	47	211
Ophir.	350	375
Hale & Norcross.	970	960
Excelsior.	8	240
Savage.	500	830
Empire Mill.	180	160
Alpha.		2
Lady Bryan.		1
Dancy.	19½	20
Confidence.	30	37
Baltimore Amer.		
Central No. 2.	5	2
Kentucky Cop Co.		
Golden Rule.		30

LATEST BY TELEGRAPH.

NAME.	BID PER FOOT.	NAME.	BID PER FOOT.
Gould & Curry.	800	Crown Point.	1050
Savage.	1050	Yellow Jacket.	700
Empire Mill.	200	Belcher.	200
Chollar-Potosi.	200	Alpha.	300
Ophir.	350	Imperial per share.	110
Hale & Norcross.	1050		

Patent Claims.

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

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

55,498.—ROCK DRILL.—John Greives, Brooklyn, N. Y.:

I claim the drill constructed of a central polygonal rod with cutting point and angular sectional cutters bolted to the sides of said rod, substantially as herein specified.

55,514.—MACHINE FOR TUNNELING ROCK.—Thales Lindesley, Rock Island, Ill.:

I claim, 1st. The drill-gauge, substantially as and for the purposes specified.

Further, the ram-guide, in combination with said gauge, the ram, and the drill-wheel, substantially as herein specified.

Further, constructing the drills and the drill-shafts, and connecting the same, substantially as set forth.

Further, the combination of the compensating springs with the drill-shafts, substantially as set forth.

Further, the drill-shaft-guides and the notched collars between the compensating springs, substantially as specified.

Further, the water pipes and jets in connection with the drill-wheel and ram, substantially as set forth.

Further, the combination of parts forming the drill-wheel, substantially as set forth.

Further, the grooved collar upon the long ram-sleeve and the clutch attached to the rear face of said drill-wheel and working into said collar, substantially as herein specified.

Further, the ram and the ram-hammers, substantially as herein specified.

Further, the wedge index, in connection with said hammers, or their equivalents, together with the splitting apparatus, substantially as set forth.

Further, the ram wheel and its adjustable cams for working the drills, substantially as set forth.

Further, the drain drill, and the collar upon the long ram-

sleeve, which serves as its guide, constructed and arranged substantially as described.

Further, the non-revolving of the ram-sleeve aforesaid, and the non-revolving of the short ram-sleeve of the rear frame of the machine, as specified.

Further, the combination of the valves receiving the compressed air to the ram-cylinders, and the valves discharging it from them with a hand lever, so as to control the action of the ram, etc., by a touch of the engineer, substantially as set forth.

Further, the construction of the platforms upon the legs of the machine, substantially as described.

Further, the supporting of the machine upon friction-wheels, beveled upon their face, substantially as set forth.

Further, moving the drilling apparatus back and forward by means of the ram-cylinders and their connections, substantially as set forth.

Further, moving the ram back and forth at any velocity desired by the engineer by means of the ram-cylinders and their dependences, substantially as specified.

Further, moving the machine by means of said ram-cylinders, and the toggle-levers, substantially as set forth.

Further, the toggle-levers and their necessary appendages, substantially as set forth.

Further, the bracket drill, constructed and operating substantially as specified.

Further, the hauling out of the debris by means of the drag-pulley and its appendages, substantially as specified.

Further, also the hauling out of the debris by means of the ram, and the tackle and clamps appended, substantially as specified.

Further, the combination whereby the ram and the drill-wheel are united and revolved, substantially as set forth.

Further, the combination of the machines, constructed substantially as herein set forth, the method of leveling the same transversely of the tunnel, and of adjusting it to the grade line of the excavation, as herein specified.

Further, the combinations by which the ram-cylinders operate without the oscillating cylinders or in conjunction with them, and vice versa; by which the bracket-drill works independently of the drill-wheel, or simultaneously with it; by which the drag pulley hauls rock independently of, or contemporaneously with, the snag-pulley, and vice versa; by which the drill-wheel revolves without the cam-wheel or in conjunction with it; by which the ram-cylinders through the toggle-levers may move the machine forward and backward, whilst the oscillating cylinders through the drag-pulley are hauling out rock from the heading; by which the arrels are kept home to their work and at the point of maximum action, and by which the bottoms of the concentric channels are kept relatively in the same plane, whatever the disparities in the hardness of the rock cut; by which the ram is permitted, at the will of the engineer, to move independently back and forth and without shock to the machine from the oscillations; by which the drills for the heading are kept cool, the dust from them laid, and their minute chips swept out of the concentric channels into the common drain; by which a drain is cut in the bottom of the tunnel parallel with, and directly under, the axial line of the same; by which the machine progresses forward and backward with or without the convenience of a railroad, and by which the tunnel, adit, etc., are supplied with an abundance of fresh air and water; by which, finally, the drill-wheel, the cam-wheel, the ram, the bracket-drill, the drag-pulley, the snag-pulley, the ram-cylinders, the oscillating cylinders, and other parts may operate concurrently and otherwise; all of which substantially as presented.

55,557.—COAL ELEVATOR.—John P. Tucker, South Reading, Mass.:

I claim the combination of the slotted arm, E, the curved lever, H, provided with the tripper, C, the director, J, the scoop, I, and the rope, K, with the gallow-frame and its discharging chute, the whole being arranged and made to operate substantially as above set forth.

Special Scientific Brevities.

The British Admiralty have determined to give the Monitor system a severe trial by firing a steel bolt at one of the turrets at short range, from an Armstrong 10-inch, or 300-pounder gun. It is to be remembered that the English turrets are not precisely like ours. They are made of wood, with an iron plating, while ours are all iron. The English construction is adhered to in order to have a difference, in spite of the fact that this difference brings with it some decided inferiority.

The evaporative value of a fuel can be better calculated from a careful chemical analysis than by testing it under a boiler. All fuels consist of carbon and hydrogen. Carbon has an evaporative power of 15, and hydrogen of 6. Multiply these by the respective amounts of them in the fuel, take the sum, and this will be the best possible evaporative value of the fuel.

An alloy consisting of ten parts of cast iron, ten of copper, and eighty of zinc, does not adhere to the mould in casting, and it is of a beautiful luster when filed and polished. The most frictional metals are melted first, and the zinc last, in making it.

An error in placing a fine dot which fixes the length of a base line in astronomical measurements, amounting to 1-5,000th part of an inch, will amount to an error of 76 feet in calculating the diameter of the earth, 396 miles in the sun's distance, and 6,800,000 in the distance of the nearest fixed star.

Singularly enough the mail brings news of an explosion in Australia of a quantity of nitro-glycerine, with terrible results. It is remarkable to have so many accidents suddenly spring from an unknown substance.

When water is boiled under oil and the steam collected and condensed a bubble of gas remains, which is found to be nitrogen, proving the absorptive power of water upon gases.

The well-known value of phosphate of lime as a manure is now attributed to a power which that substance possesses of purifying flesh or nitrogenous substances.

The use of cotton is literally universal. Out of 1,25,000,000 people in the world, 700,000,000 wear it exclusively, and all but 70,000,000 use it more or less.

One of the ancient aqueducts which supplies Jerusalem with water, is formed of blocks of stone so keyed together as to form a perfect syphon.

Ivory may be rendered quite flexible by soaking it in hydrochloric acid. On drying it becomes hard again, but water will now restore its flexibility.

Ozone is found to be developed by the mechanical action of blowing machines—a fact which may partly account for the healthfulness of winds.

Mineral and other On-dits.

It is stated that the rock on the western end of the Hossac Tunnel, which inspired so much confidence in its

Test for Phosphorus in Iron and Steel.

Mr. John Spiller, assistant chemist of the English War Department, has found that for the purpose of concentrating the whole of the phosphorus contained in the solution of the specimen of iron under examination, in a comparatively small proportion of ferric oxyd, it is only necessary to add to the nitro-hydrochloric solution, after reduction by sulphurous acid, aqueous sesqui-carbonate of ammonium, until the precipitate which forms, and which is at first red, assumes a greenish hue. All the phosphorus is contained in this precipitate, in the form of phosphoric acid, combined with ferric oxyd, and is obtained as pyrophosphate of magnesium, by treating the precipitate just as the corresponding precipitate of mixed acetate and phosphate of ferric oxyd is treated in the ordinary process. Mr. Spiller's modification effects a considerable saving of time, without in the least impairing the accuracy of the results.—*Mechanic's Magazine*.

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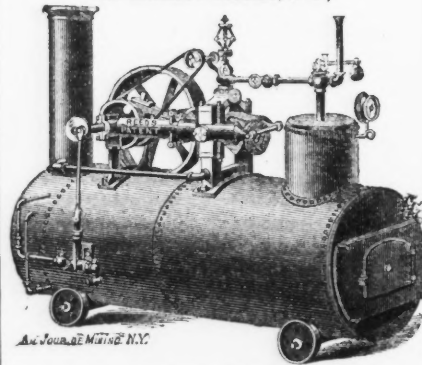
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Am. Jour. of Mining, N.Y.

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At Denver City, Colorado, connecting with their double daily line of coaches for Central City, Blackhawk and Empiro City.

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 tending to erect Machinery in California, Nevada, Idaho,
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 The fact being indisputable that many of the failures in mining
 operations are caused by not having machinery adapted to work-
 ing the ore, it is of the first importance to start right on this
 point.
 Mr. CYRUS PALMER, one of the proprietors of the Miner's
 Foundry, San Francisco, has lately arrived, and will remain in
 New York and vicinity for some months, and is prepared to take
 contracts to furnish all kinds of mining machinery of the most
 approved style at short notice, delivered in San Francisco, or at
 any of the mines on the Pacific coast. He will also, if required,
 contract to build mills at the mines, and put them in complete
 running order.
 Mr. Palmer has just left the Pacific coast, and is therefore, ac-
 quainted with the most approved machinery in use for reducing
 ore and saving the precious metals. Mr. P. has not only been
 actively engaged for the last ten years in manufacturing mining
 machinery, but has had large experience in working mines and
 reducing ores. On application to his address, 25 Nassau street,
 by letter or otherwise, he will be pleased to give any information
 required in regard to mining or other machinery, gratis, to any
 company, whether they wish to contract or not.
 Mr. Palmer refers to the following companies for whom the
 Miner's Foundry have built mills the past year:
 Knickerbocker and Nevada, 70 Cedar street; Lincoln Company
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 Mr. Palmer can be found at the office of R. H. Vance, Esq., 25
 Nassau street, corner Cedar, from 11 to 12 o'clock, daily 1-ps

**THE "SHAW"
 COPPER MINE.**

Public attention has several times, of late, been directed to the
 great mineral resources of Canada East, and the riches of the
 copper fields have been given prominence to by Sir William Logan,
 in his "GEOLOGY OF CANADA," and Mr. Herbert Williams, the Su-
 perintendent of the

HARVEY HILL MINE,

has done much, practically and by writing, to enable us to form
 a correct estimate of the immense value of that great mine. In
 the same synchinal there are the copper deposits of Sutton, Shef-
 ford, Stukely, Melbourne, Skipton, Chester, Halifax, Leeds, Inver-
 ness and St. Mary; and Lot on No. 9, in the 6th Range of the Town-
 ship of Chester, is

THE SHAW MINE,

which at present may be viewed only as second to HARVEY
 HILL, from its being less developed. The Copper, which is in the
 form of purple and yellow sulphurets, is found in the "mucous"
 slates; and "green carbonate," associated with quartz, has been
 discovered in several of the outcrops, giving to the copper bearing
 schists a considerable wealth. Mr. Herbert Williams, who is
 highly esteemed by Sir William Logan, as a practical mining en-
 gineer, twice visited the property, in January and November,
 1865, and reports the results of operations thus:

"No. 1 opening exhibits fair samples of purple and yellow sul-
 phurets, associated with quartz veins.
 "No. 2, distant SE. from No. 1 about 200 feet, exhibits wide
 bands of "mucous" slates, carrying veins of quartz. This out-
 crop, for a width of 50 or 60 feet, carries some promising samples
 of purple and yellow sulphurets, and, also, the green carbonate
 in notable quantity." Mr. Williams adds: "Adjoining this, to the
 SE., is the "VIGOR" mining locations, upon which most promising
 discoveries of copper ore have been made, and are now being
 opened up; these dip towards, and will, I believe, be found to
 underlie, to a very considerable extent, the SHAW property."

In November, Mr. Williams reports: "The most important
 operation, since my previous visit, is the sinking of a shaft, to the
 depth of about 27 feet, in a band of copper-bearing schist situated
 to the westward of the openings referred to in my first report.
 This band has an average width of between 4 and 5 feet, and shows
 some fine and promising samples of purple and yellow sulphurets
 of copper, some tons of which have been broken and brought to
 the surface. The continuation of this band, notwithstanding its
 being capped over in several places, is discovered by the outcrops
 for a distance of between 500 and 600 feet, and, combined with
 the very promising appearance of the shaft, warrants my recom-
 mending a more vigorous trial of the property."

The contour of the lot presents many advantages for economic
 mining. The high ground SE. of the Craig coal will admit of
 mining by "adit" or "cross-cut" to a very fair depth, thus dis-
 pensing with the use of expensive machinery for many years to
 come. There is abundance of wood on the property for all mining
 purposes, as well as for fuel; and one decided advantage which it
 possesses over the Harvey Hill Mine, is the abundant supply of
 water from a river passing through the property, which will en-
 able the ore to be dressed at a very moderate cost.

The distance of this mine from the Athabaska station on the
 Grand Trunk Railway is 15 miles, by a moderately good road, and
 the transport of materials to and from the mines to that station
 will not exceed \$3 per ton. Athabaska station is 64 miles from
 Quebec, and 26 from Richmond, on the Portland road. Laborers
 can be found as required, and at moderate wages.

In following the course of this synchinal in a south-westerly di-
 rection, the copper-bearing slates present themselves in several
 places, and there is no difficulty in tracing them, notwithstanding
 the absence of gossan, and there are other characteristics observ-
 able by which their existence is identified—one of which is the
 association of chlorite with the slates. The metamorphic action
 of the copper on the slate is characterized by some peculiar al-
 terations whenever the copper is in contact with it. The dis-
 covery of the existence of further quantities of copper may there-
 fore be reasonably expected.

The advantages thus offered by the "Shaw Mine" may be thus
 summed up:

- 1st. The existence of Copper ore of available richness in large quan-
 tity, and which can be easily worked for sometime by "adit"
- 2d. The Mine being easily accessible, and only a short distance
 from the Grand Trunk Railway.
- 3d. Cheap transport and cheap labor.
- 4th. Water and wood in sufficient abundance.

These all point out, that if any Copper Mine in Canada can be
 worked successfully, the "Shaw Mine" offers facilities, which
 must place it pre-eminently in that category, and encourage its
 owners to look forward to no distant day for returns, which must
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