

ENGINEERING and MINING JOURNAL.

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ARTHUR F. WENDT, E.M., denies the correctness of the statements accredited to him by the *Globe Silver Belt*, of Arizona, in relation to the Longfellow copper mine. See his note in another column.

THE meeting of the American Institute of Mining Engineers in this city this week, although a great success, did not have the attendance of a number of the prominent members, owing to the activity in all branches of mining, and the great call there is for the services of the mining engineer.

THE increase in the demand for anthracite coal, and the advance in prices, have been so great during the past week, that dealers and producers call it a "boom." With the prospects of strikes in the leading bituminous fields, and under the curtailment of production that will continue among the producers of anthracite coal until April 1st, the outlook is very favorable for the anthracite companies. In fact, it looks as though a combination of causes would put the anthracite trade upon a basis that will enable it to go along profitably during the rest of the year.

MR. R. B. HARRISON, Superintendent of the Helena (Mont.) U. S. Assay Office, has been, for some time, acting with the Commission charged with making the annual assays and tests of United States coins at Philadelphia. The work has been completed, and the results are extremely satisfactory; even the coins stamped at the New Orleans Mint have been found quite up to the standard, which could scarcely have been expected for new machinery and a new organization.

MR. HARRISON has attended the meeting of the Institute of Mining Engineers in this city, during the past week. He reports the mining outlook in Montana as extremely favorable, and looks for a large influx of both men and money during this year.

MONTANA mines are looking up. Professor CLAYTON reports enormous wealth in several which he has recently examined, and Professor W. P. BLAKE has also, we understand, reported favorably upon some of the best known mines near Butte City. On the other hand, we hear quite unfavorable reports from the Penobscot, which is said to be now in barren quartz and the new work all in poor ground. This will be a great disappointment to the Eastern stockholders, who had reason to think this would prove a valuable property. Serious complaint has several times been made by correspondents in these columns with regard to the skill with which the property has been managed, and it now seems evident that the very large expenditures for mill and other improvements were quite uncalled for until much larger reserves of ore had been accumulated in the mine.

We understand that new material has entered the management, and that a competent authority will be sent to examine the property and to advise upon future operations.

THE market value of seats in the San Francisco Mining Exchange has declined from \$50,000 to \$6000, with the demand "weak." The causes named are: First, the new California Constitution, that somewhat interferes with the wilder forms of gambling which have heretofore constituted a large part of the "mining business" of San Francisco; and secondly, the revival of mining in New York, which city is rapidly becoming the great mining center, as it has always been the financial center of the country.

Unquestionably, New York will hereafter always be the focus for mining transactions; but we believe the real cause of San Francisco's decline lies in the infamous system of mine management that has long ruled there. Under this, the mines and stocks have been manipulated solely in the interest of the managers, and the public has been systematically exploited till the whole available capital of the Pacific slope has been concentrated in the hands of a small number of leading operators. The number of pigeons to be plucked has rapidly decreased, and the birds are both in poor condition and very wary, so that "business is naturally dull;" hence the change of base to New York, where, no doubt, the same games would, and perhaps will, be tried, just as far as they can be made profitable for the insiders.

Moreover, the Comstock mines are not in bonanza, and even now are selling at many times their intrinsic value, which, with a vast number of them, is a good deal less than nothing. No doubt the present managers will make great and systematic efforts to unload these worthless stocks on the Eastern public, and every facility will be given to speculate in them, by lending money on stock, and by running them up and down so as to excite an interest in them. The final result of what may be termed, in a general way, San Francisco or Comstock-Tuscarora management and manipulation, if practiced, would be precisely the same here as it has been on the Pacific slope, where it has made a few men very rich by impoverishing and utterly demoralizing a whole community.

THE MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The meetings of this body began on Tuesday night, at the rooms of the American Society of Civil Engineers. The meeting was called to order and a short address was made by Mr. ECKLEY B. COXE, the President. Papers were read by Mr. E. F. LOISEAU on "The Successful Manufacture of Compressed Fuel at Port Richmond, Pa.;" by Prof. R. H. RICHARDS, of Boston, "Notes on Battery and Copper Plate Amalgamation, from the Mining Laboratory of the Massachusetts Institute of Technology." Prof. PRIME offered the following resolutions:

Whereas, The American Institute of Mining Engineers has seen with regret that the work of the United States Testing Board has been suspended, through the lack of an appropriation by Congress, which appropriation does not seem likely to be renewed; and

Whereas, It seems most important to the vital interests of our iron and steel manufacturers that the experiments commenced by the United States Testing Board should be carried to successful completion;

Resolved, That a committee of three be appointed, to act with a like committee to be appointed by the American Society of Civil Engineers, to carry out to completion the work commenced by the United States Testing Board.

Resolved, That the American Society of Civil Engineers be requested to cooperate with this Society by the appointment of a like committee.

Resolved, That the committee have authority to request, in the name of the American Institute of Mining Engineers, contributions to a fund to be devoted to the completion of the experiments aforesaid.

Resolved, That the Council of this Institute be authorized, whenever requested by the committee so appointed, to petition Congress for the free use of the testing machine at the U. S. Arsenal at Watertown.

On Wednesday morning, a paper by P. H. MELL, Jr., of Auburn, Ala., on "The Claiborne Group and its Remarkable Fossils," was read. This was followed by a paper by Mr. JULIEN KENEDY on "Blast-Furnace Working." Mr. A. L. HOLLEY exhibited a very ancient piece of iron, which, according to Dr. WENDEL, of Troy, gave the following analysis:

Iron.....	98.738	Copper.....	.102
Carbon.....	.521	Calcium.....	.218
Sulphur.....	.069	Magnesium.....	.078
Silicon.....	.017	Aluminum.....	.070
Phosphorus.....	.048	Slag.....	.150
Manganese.....	.116		
Nickel and cobalt.....	.079	Total.....	100.096

MR. J. M. HARTMAN read a paper entitled "Notes on the Blast-Furnace," and Mr. PERCIVAL ROBERTS, Jr., one on the "Puddling Process Past and Present." Mr. R. B. HARRISON, of the United States Assay Office, at Helena, Mont., exhibited and described some rare specimens of crystallized gold. Mr. E. B. COXE read a brief paper on "The Use of Carbonate of Soda in Boilers." At the afternoon session on Wednesday, the Secretary read the Council's report, which showed that the receipts during the year amounted to \$7122.65, and the disbursements to \$6483.44. The membership is as follows: Honorary members, 5; foreign members, 53; regular members, 616; associates, 118; total, 792.

DR. HENRY WURTZ presented a Paper on "The Strong Water-Gas." A paper by W. H. MERRITT, on "The Coal and Iron Field of North Stafford-

shire, England," was read by Dr. T. M. DROWN. On Thursday, C. K. BOYD read a paper on "The Resources of West Virginia," and N. S. KEITH read one on "The Electric Light as Applied to Mining."

The social events have been quite a feature of the present meeting. With the receptions, dinners, etc., the members of the Institute have had but little chance to secure their normal rest. On Wednesday night, Mr. and Mrs. JAMES A. BURDEN gave a reception which was very largely attended. On Thursday night, the Bullion Club gave another, at which short addresses were made by several members of the Institute and the Club, and a very enjoyable evening was passed. Last night, the regular dinner of the Institute was given.

The following members and associates were elected :

## MEMBERS.

E. C. Appleton, L. Canal and N. Co., Pa.  
 Charles A. Bauer, Springfield, Ohio.  
 Jackson Bailey, New York City.  
 Theodore A. Blake, New Haven, Conn.  
 Alfred P. Boller, New York City.  
 J. B. Brinsmade, New York City.  
 John C. Brown, Philadelphia.  
 Henri M. Braim, New York City.  
 Harvey B. Chess, Pittsburg.  
 Richard E. Chism, Norristown, Pa.  
 A. W. Crookston, Glasgow, Scotland.  
 L. L. Crouse, Kingston, N. Y.  
 Gram Curtis, New York City.  
 W. B. Devereux, King's Mountain, N. C.  
 Charles E. Emery, New York City.  
 Hiram H. Fisher, Allentown, Pa.  
 George G. Frances, Montreal, Canada.  
 James Gayley, Catasauqua, Pa.  
 Robert Grimshaw, Philadelphia.  
 John H. Grove, Danville, Pa.  
 Henry J. Hall, New York City.  
 J. F. Hantranft, Philadelphia.  
 Ethan A. Hitchcock, St. Louis, Mo.  
 W. A. Hooker, New York City.  
 Frederick T. Hunt, Capelton, Can.  
 J. E. Johnson, Longdale, Va.  
 John T. Jones, Sharon, Pa.  
 Clarence King, Newport, R. I.  
 James G. Knap, Philadelphia.  
 John H. Knox, Andover, N. J.  
 James C. Lewis, Portsmouth, O.  
 John C. Lewis, St. Louis, Mo.  
 Edwin Ludlow, Philadelphia.  
 A. M. McComb, Philadelphia.  
 Ed. A. McCulloh, Aurora, Ill.  
 Charles F. Manness, Scranton, Pa.  
 G. W. Maxson, Auburn, Ala.  
 C. C. Morgan, Denver, Colo.  
 J. C. Morse, Marquette, Mich.  
 William D. Mullin, Latrobe, Pa.  
 Charles M. Noble, Anniston, Ala.  
 Charles C. Newton, Cleveland, O.  
 W. N. Page, Hawk's Nest, W. Va.  
 Charles T. Porter, Newark, N. J.  
 R. D. Rickard, Middleton, N. Y.  
 William B. Ridgely, Springfield, Ill.  
 E. E. Robinson, St. Albans, Vt.  
 W. T. Sprague, Scranton, Pa.  
 David Townsend, Philadelphia.  
 Charles R. Westbrook, Ogdensburg, N. Y.  
 C. A. Wheelock, Santa Fé, New Mexico.  
 Samuel Whinery, Wheeler, Ala.  
 David Williams, New York City.  
 Walter C. Witherbee, New York City.

## ASSOCIATES.

F. E. Bachman, Easton, Pa.  
 C. P. Bleecker, New York City.  
 Alexander B. Coxe, Drifton, Jeddo P.O., Pa.  
 Austin Farrell, Easton, Pa.  
 Frank Klepetko, Cleveland, O.  
 W. B. Kunhardt, New York City.

The following officers were elected for the ensuing year :

President—W. P. SHINN.  
 Vice-Presidents—JAMES A. BURDEN, C. B. DUDLEY, PERSIFOR FRAZER, JR.  
 Managers—J. C. BAYLES, W. S. KEYES, PERCIVAL ROBERTS, JR.  
 Treasurer—THEODORE D. RAND.  
 Secretary—THOMAS M. DROWN.

## THE DUTY ON STEEL RAILS.

The *Tribune* publishes the following dispatch, with this sub-heading :  
 "A formidable opposition to the proposed reduction of duty. Representatives of fifteen thousand miles of railway protest.

"WASHINGTON, Feb. 17.—Memorials having recently been presented to Congress from a number of railroads for a reduction of the rate of duty on steel rails, and it having been asserted at the hearing before the Ways and Means Committee that the reduction was demanded by nearly all the roads in the country, a very extensive counter demonstration of the opposing interests was made to-day by the presentation in the two houses of Congress, through Representatives and Senators, of memorials from the following railroad officers protesting against the reduction as injurious to the railroad interests as well as to the American steel industry :

Franklin B. Gowen, President of the Philadelphia & Reading Railroad, 869 miles of road.  
 G. B. Roberts, Vice-President of the Pennsylvania Railroad, 1782 miles of road.  
 J. N. McCullough, Vice-President 'Pennsylvania Company,' 1535 miles of road, and Vice-President of the Pittsburg, Cincinnati & St. Louis Railroad, 301 miles.  
 A. J. Cassatt, Vice-President of the Northern Central, 322 miles ; Vice-President of the Baltimore & Potomac, 90 miles ; and Vice-President of the Alexandria & Fredericksburg Railroad, 32 miles.  
 A. B. Stone, President of the St. Louis, Keokuk & Northwestern, 125 miles.  
 T. B. Blackstone, President of the Chicago & Alton, 678 miles.

T. C. Platt, President of the Southern Central of New York, 114 miles.  
 John S. Barbour, President of the Washington City, Virginia Midland & Great Southern, 360 miles.

Robert H. Sayre, President, and R. A. Packer, General Manager, of the Pennsylvania & New York Canal and Railroad, 128 miles.  
 Alexander Mitchell, President of the Chicago, Milwaukee & St. Paul, 1512 miles.

James Callery, President of the Pittsburg & Western, 47 miles.  
 Henry Wood, President of the Philadelphia & Baltimore Central, 57 miles.  
 G. St. John Sheffield, Vice-President of the New Haven & Northampton, 109 miles.

Albert Keep, Chicago & Northwestern, 2158 miles.  
 Le Grand B. Cannon, Director of the Delaware & Hudson Canal Company's Railroad, 665 miles.

E. F. Hatfield, Jr., President of the Green Bay & Minnesota, 244 miles, and the Secretary and Treasurer of the Sussex Railroad, 34 miles.  
 Samuel Sloan, President of the Delaware, Lackawanna & Western, 670 miles.

M. E. Ingalls, President of the Indianapolis, Cincinnati & Lafayette, 195 miles, and President of the Cincinnati, Lafayette & Chicago, 56 miles.  
 F. A. Comly, President of the North Pennsylvania Railroad (mileage included in the Philadelphia & Reading).

E. C. Knight, President of the Central Railroad of New Jersey, 561 miles, and President of the Delaware & Bound Brook, 31 miles.  
 William A. Ingham, President of the East Broad Top Railroad, 30 miles.  
 Charles Hartshorne, President of the Lehigh Valley Railroad, 303 miles.

Isaac Hinckley, President of the Philadelphia, Wilmington & Baltimore Railroad Company, 207 miles of road.  
 "These railroads, according to Poor's *Manual* for 1879, have a total length of 15,125 miles of road.

"The representatives of the above railroad companies here announce that a large number of smaller petitions are on their way."

This is, without doubt, the "thinnest" railroad representation we have seen for a long time. Among the names is the president of one steel company, while we notice a number of prominent stockholders in the various steel companies. The committee considering this subject will do well to ascertain whether, in the majority of cases, the above-named gentlemen have not greater personal interests in the profits they will make directly or indirectly on steel rails under the present duty, than from their interests in the railroads which they represent.

## HYDRAULIC MINING IN GEORGIA.

EDITOR ENGINEERING AND MINING JOURNAL :

SIR : I have recently visited several of the principal gold mines now worked in the vicinity of Dahlonega, Georgia. The processes in use there have been very much modified within a few years past, and in some respects they are novel to me.

A combined system of hydraulic and mill process seems to be the one best adapted to the extraction of gold from the ores of that vicinity, and is much used, though in some cases the stream of water is used merely as a means of transporting the ore to the mill, and is called "flooding." This is the plan pursued at the Findley mine, at which place fifty stamps are supplied with ore from the mine. I visited the mills on this property, but did not examine the mine itself, which is being developed by tunnels and open cuts. The rock at this place is too hard for hydraulic work with a "Giant;" but the ore mined on the high hill back of the mill is thrown into rock-slucices and washed into the mill below. I did not see any wooden sluices, and I do not think that any quicksilver is employed in the rock-slucice. At the time of my visit, about the first of February, very rich specimens of gold quartz were being taken from the "shoot." This "shoot" is, I am told, a detached branch of gold and galena bearing quartz, so rich that it has paid to work after a string not over a few inches in diameter. A tunnel which had been run about three hundred feet into the hill, to cut this "shoot" at a level about one hundred feet below the point at which work in a shaft had been abandoned on account of water, had just opened into the rich ground when I was there, and beautiful specimens of gold, accompanied by galena, from it were shown me by Mr. Enos, the superintendent of the mine. All the external appearances of the mine and mill would seem to indicate prosperity to the practiced eye, but I have no data of their work. The large mill (40-stamps) is run by water-power.

At the Barlow mine, situated about three miles south of Dahlonega, a small "Giant" nozzle, 1½ inches in diameter, is worked. The schists, in which small lenticular masses of quartz are found, are very soft and easily melted away before the hydraulic stream. A wooden sluice, provided with longitudinal riffles, called "frames" in that section, conveys the entire *débris* from the cut to the mill, situated a half-mile distant, on Cane Creek. The present mill of twenty stamps, run by water-power from the creek, is in the building of the old "Pride mill," which Mr. Clarence King described as "a distinguished monument of folly."

All the old machinery, which consisted of all kinds of fancy stamps, a large engine and boiler (erected at a point where there was a good available water-power, now used), pans and settlers of various shapes and sizes, has been removed, and a twenty-stamp mill designed by Mr. Hall of Dahlonega put in its place. The plan of this mill is excellent. It is entire in itself, when framed and put together, and could be set down on a gravel heap and worked just as well on a more substantial foundation. However much it settled, it would all go together—mortar-blocks, mortars, stamps, cams and cam-shaft, and the amalgamating plates would all maintain their relative positions. A false front and iron lagging to the sides and backs of the mortars, which can not work loose when the mill is running, render access to the interior of the batteries, for cleaning up or for changing shoes and dies, very easy.

The sluice terminates in two branches, one of which runs into one side of an ore-shed, and the other into the other side, a longitudinal partition separating the shed into two equal halves. About one third of all the solid material brought down by the current is deposited in this shed, the remainder being carried off in suspension in the water. The shed is about 100 feet long by 50 feet wide. One half is filling up while the ore from the other half is being carried to the mill, about 100 yards off. The material collects on these floors to the height of from 3 to 5 feet, and is simply dug out, and loaded on cars running on a tram-road. A large

portion of the material milled contains no appreciable amount of gold, it having been thoroughly disintegrated in the sluice, and whatever gold it originally contained having been amalgamated in the riffles. There being no machinery at hand to separate this barren material from the quartz and coarse sand which carries gold, the whole mass has to be milled.

The introduction of "grizzlies" and punched plates would remove the larger pieces of quartz, and if the material was then run on to large jigs, like those used in coal-washing, I think that all the auriferous material could be easily and cheaply saved, and the barren portions got rid of without the necessity of putting them through the mill. As the company is now contemplating the addition of twenty more stamps to the mill, in order to enable it to work more material from the cut, I think it would be well to consider this suggestion before making the outlay.

With the arrangement I suggest, I am quite positive that it could mill all the auriferous material brought down in the present mill. The superintendent of the mill, Mr. Weaver, to whom I am indebted for many courtesies, informs me that the cost of milling is but twenty-two cents per ton; three to three and a half tons per day per stamp being about the usual work.

At the Dahlenega mine, situated about six miles southwest of the town of the same name, a two and one half inch hydraulic nozzle, with one hundred and sixty feet head, is employed. The rock worked is quite hard, much of it being too hard to pick. Some giant-powder is employed to shake it up, after which it can be cut down by the stream. The work is slow, and the material worked is "pockety." The pockets are quite rich when struck, but very irregularly distributed. I do not think that the mine is paying very largely.

The Barlow property is well located, and the character of the material is very uniform. The concern is evidently quite prosperous. From what I know of it, I think that they are clearing a couple of thousand dollars per month, as their expenses are light.

WILLARD P. WARD, M.E.

#### THE CLIFTON COPPER MINES, ARIZONA.

Special Correspondence of the Engineering and Mining Journal.

The Clifton copper mines, in Frisco District, Apache County, Arizona, a number of which are owned by Henry Lesinsky & Co., are destined to attract wide attention, by reason of their becoming extensive producers of that metal. They are located in a group of rugged mountains lying northwest of the San Francisco River, 15 miles above its confluence with the Gila River, and are from 5600 to 7000 feet above sea-level. The Longfellow mine is the best known outside of the district, and has, for several years, been successfully worked by the Lesinsky Company. This lode had so many outlying deposits of ore in its surface works that people talked of it as "a mountain of copper" ore; but in the lower levels, only some 200 feet deep, immense bodies of high-grade ore appear more in vein form than at any point above. The ore, taken as it comes, with scarcely any assortment, averages 18 to 20 per cent in actual copper yield. It is easy for those who know the way, to smelt it, the red oxide and black and other carbonates being mixed in the proportions found most suitable for effective reduction.

#### THE OTHER MINES

of the company are only slightly developed. Most of them promise to open and yield well. On what is known as the Coronado lode, lying five miles northwest of the Longfellow, there are six 1500-foot locations, all owned by the Lesinsky Company.

Every one of these claims shows rich copper glance, and medium-graded carbonate and silicate ore. The vein, a northeast and southwest one, is in granitic rock, and is cased on both sides with porphyry, whereas the Longfellow and adjoining mines are in a red and white colored porphyry with some limestone, shale, and siliceous slate, appearing on one side.

The Coronado lode is very strong, well defined for the work done on it, and is likely to prove a great mining property. Its deepest incline is only 65 feet; but in it, and in numerous open-cuts along its course, streaks from 2 up to 30 inches wide of 60 per cent copper glance are seen interlacing the vein-matter, which is from eight to twelve feet in thickness, and seemingly in places much more.

Unlike the Longfellow ore, the higher grades, at least, of this Coronado ore will have to be roasted in heaps, before being smelted.

#### THE MINING WORK

on the Longfellow lode is performed by 60 Chinamen and 20 Mexicans. As experience has long ago shown, in other quarters, that Chinese labor in mines—where there are opportunities for skulking and stealing candles and blasting-supplies—is any thing but profitable, I was not surprised to find that eighty men only extracted 17 to 20 tons of ore per day, while twenty white miners could easily have broken down an equal amount. I believe the output has been largely increased of late, but it will be strange if the owners do not get tired of their Asiatic employes at no very distant date.

The mining work has been any thing but skillfully laid out or economically done, and to put the Longfellow mine in a really safe and satisfactory condition, a considerable expenditure is necessary. A narrow-gauge railroad of 4½ miles, leading from this lode to the furnaces, has been recently completed, and once a car-track is laid in the works, so as to save moving ore and waste four to five hundred feet by wheelbarrows, an important saving will be effected in the working expenses.

#### THE COMPANY'S SMELTING FURNACES,

situated at Clifton, on the San Francisco River, are worthy of special notice. There are three 30-ton shaft blast-furnaces, one only, however, being used at a time. They are square in cross-section, 35 inches wide inside at bottom, and 42 at top. From the tuyeres to the bottom of the feed-hole the height is 8 feet, and to the top 10 feet more. The feed-hole is 38 inches wide and 26 high.

For 3½ feet vertically, where the heat is greatest, the furnaces are lined with, or rather built of, copper slabs or molds, cast at the works. These slabs, measured as solid, are 38 inches long, 9½ wide, and 6 thick. They

are cast with two cavities 16 by 7 inches and 3 inches deep, and each is therefore a sort of shallow double trough, the bottom of which is 3 inches thick. When they are placed on edge and bedded in clay, the bottoms form a smooth surface against which the molten contents of the furnace have so little effect that they continue intact from six to twelve months. As only a small part of the copper contained in the slabs is lost, and the expense of casting new ones is but a dollar each, this kind of lining is not costly. By means of iron straps, the slabs are held securely in position. To admit of their being freely exposed to the air on the outside, a gap is made in the brick-work of the furnace opposite to them, the walls above being supported on four hollow copper pillars cast on the spot in short pieces, set one on the other, and secured by iron bands.

#### A FORTUNATE DISCOVERY.

Until copper linings were used, the Lesinsky Company found it impossible to run at a profit. Experts at high salaries were employed, but success in producing merchantable copper did not attend their efforts, and ere long the property owed nearly \$150,000.

One time, when the lining of a furnace had given way, a copper plate, lying around, was thrust into the opening, and, strange to say, it was equal to the duty required of it. Some one forthwith secured a patent for the principle involved, but I have not heard of its being successfully applied anywhere, save at Clifton. The Eureka Consolidated Company was induced to try the lining for smelting argentiferous ores; but the slabs were soon destroyed, and Pancake fire-rock was substituted.

#### SMELTING.

Mr. Louis Smadbeck, the head smelter at the Clifton Works, and who, along with Mr. Henry Lesinsky, is entitled to great credit for what has been so well done under adverse circumstances, favored me with some particulars as to the mode of operating the furnaces.

When the ore is dry, the charge is 290 pounds of ore to 65 pounds of charcoal, made every ten minutes.

A pound of charcoal, therefore, costing 1½ cents, or about 26 cents per bushel, smelts 4½ pounds of ore, and 450 pounds will suffice for 2000 pounds of ore—the grade being 20 per cent. The metal, which is known as black copper, containing 90 to 92 per cent, is drawn off every three hours and run into large copper molds of home make. The bars or pigs, weighing about 200 pounds, are shipped by freight teams and cars, to be refined on the Atlantic coast.

Unlike the arrangement adopted in the best lead-smelting furnaces, the three tuyeres provided for each furnace at Clifton apply the blast only on the back, the spaces between them being 6 inches. They are not protected by water sheaths.

All smelting labor is done by Mexicans, 25 men being employed, at the average wages of \$2 per day. The total cost of reducing 2000 pounds of ore is about \$12.60, but this does not include interest on invested capital.

We have many promising copper lodes in Arizona, but probably there are none equal in extent, richness, and value to the Clifton mines. It has been impossible hitherto to do any thing with copper ores in the San Francisco market, as buyers there offered no inducements to shippers. Fortunately, by the extension of railroads into the territory, mine-owners will soon be enabled to ship their ores or furnace products either to England by way of the Gulf of California, or to the Eastern States by overland railroad. If the railroad companies are wise enough to encourage this business by low freights, they will ultimately reap great advantages in increased traffic.

J. D. EMERSLEY.

EWELL SPRINGS, PIMA CO., ARIZ., Feb. 5.

#### NEVADA MINING NOTES.

Special Correspondence of the Engineering and Mining Journal.

Quite an excitement is now going on over in Lone Mountain, about thirty miles from this place. Lone Mountain lies in Big Smoky Valley, is surrounded on the north and east by desert wastes, and on the south and west by the great salt marshes of Montezuma and Silver Peak. It is a very high and rough mountain, and has always been quite a prominent land-mark for prospectors.

Lone Mountain is not a new discovery, although we believe that the richest and best ledges have only lately been found. Both gold and silver ore were found there in 1864, by some Mexicans from San Antonio. They sank one shaft 40 ft. deep, built an arrastra, and were preparing to extract the metals, when the Indians, who were mean in those days, drove away their stock, and forced them to abandon their prospects. Some time since, some American prospectors located several promising ledges, which have proved since to be very valuable. It is claimed that one ledge of silver lead averages over 60 feet thick. Other claims of silver chloride and gold ore have been located. Bodie capital is backing the present prospectors, who are well supplied with material to open their claims. Twenty miners are now in camp, and twenty more will arrive from Bodie this week, besides those going in from other quarters.

With the present flattering prospects of San Antonio and her mines, which are now being thoroughly developed, and the Pea Vine, Jett, and Jefferson mines on the north, and Montezuma, Silver Peak, and Lone Mountain districts on the south, San Antonio is surely destined to become the head-center of the mining interests of Nye County.

SAN ANTONIO, NYE CO., NEV., Feb. 6.

SMOKY VALLEY.

#### THE LONGFELLOW COPPER MINES—A CORRECTION.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In an article in the *Globe Silver Belt* of January 31st, mention is made of the property of the Longfellow Mining Company, which I recently had the pleasure of examining. The article referred to was published without my knowledge or authority, and many of the statements there attributed to me have no foundation in fact. ARTHUR F. WENDT.

EMPLOYMENT GIVEN BY RAILWAYS.—It is stated that there are now nearly 300,000 persons employed on the railways of Great Britain and Ireland. The importance of this fact will be apparent at once to the student of social science, since this industry has scarcely had an existence of fifty-five years.

## MONTANA MINING NOTES.

Special Correspondence of the Engineering and Mining Journal.

One of the leading jewelers of Helena is now engaged in making two silver spikes from the first silver bar ever turned out at the United States Assay Office, Helena, the silver composing the bar being the product of seven and a half pounds of rock taken from the famous Lexington lead. The spikes are to be used by the Utah & Northern Railroad for the purpose of fastening the first rail laid on the track of this road within the boundaries of Montana. This narrow-gauge railroad is the hope of the ore-producers of this country, making available the low-grade ores which at present are absolutely worthless.

The bullion shipments from Butte for the past two weeks have aggregated \$43,000—a good showing, taking into consideration the condition of the roads.

The First National Bank of Helena, a large buyer of ore and bullion, purchased, during the year ending December 31st, 1879, silver bullion \$100,000; gold bullion, \$250,000; and ores to the amount of \$150,000. This portion of their business is greatly remunerative; for the Bank, in addition to 20 per cent dividends upon its capital stock, \$100,000, has added \$20,000 to its surplus fund.

The new discoveries in the Bear Paw and Belt mountains still attract attention, and in the spring there is every probability of a stamped ore occurring for these points. Some new leads in the Bear Paw, 60 miles from Benton, have assayed as high as 600 ounces of silver to the ton. The ore is free milling.

There has been considerable difficulty in securing perfect titles to property in Butte on account of underlying mines. Last week, patents for the Carlotta, Pawnbroker, and Maximilian lodes were received, each of which is situated wholly or in part within the limits of the town site of Butte, and each has the following clause:

"Excepting and excluding, however, from these presents, all town property rights upon the surface; and there are expressly excepted and excluded from the same all houses, buildings, structures, lots, blocks, streets, alleys, or other municipal improvements on the surface of the above-described premises not belonging to the grantees herein, and all rights necessary or proper to the occupation, possession, or enjoyment of same."

This is a wise provision, and will prevent many vexatious and costly litigations, not only in Butte, but in all the mining camps of the country, if generally used in granting mineral patents.

The Gloster mine owners intend adding five more stamps to their mill, making it have a capacity of ten stamps. Their clean-up, last week, netted \$1350, or about \$27 per ton.

The clean-ups for the Belmont and Penobscot, for January, are about the same as usual. The main shaft of the Penobscot is now down 300 feet, where another level will be run.

Bullion shipments from the Alice mine, in Butte, were \$32,244, for January, or at the rate of \$400,000 per annum.

The Thornton mill is working about 18 tons of ore per day, and its management feels assured of great future success.

On the 1st of May, proximo, a heavy mining sale will be recorded in Butte. Four mines in this city, owned by W. A. Clark & Co., and known as the Stewart Late Acquisition, Late Acquisition Spur, Mount Moriah, and Anglo-Saxon, together with the Dexter mill, were bonded to O. J. Hollister, of Salt Lake City, for Eastern parties. The bond expired January 1st, 1880. An extension was asked for and granted until the 1st of May, as the new company was not fully organized, when the sale will doubtless be made. The consideration is not, as yet, made public.

Active preparations are making for the early starting up of the copper-smelter at Meaderville. As soon as the machinery and bricks, now lying at the terminus, can be hauled, every thing will be pushed to a speedy completion.

TUBEROSE.

## PETROLEUM NOTES.

COMPARATIVE SYNOPSIS OF REPORTS FOR DECEMBER, 1878 AND 1879, AND JANUARY, 1879 AND 1880.

42 GALLONS = 1 BARREL.	1879.		1878.	
	Dec. 31 days.	Jan. 31 days.	Dec. 31 days.	Jan. 31 days.
Production for the month.....	1,769,356	1,749,113	1,318,678	1,346,671
Daily average.....	57,067	56,423	42,538	43,441
Stock at the wells.....			308,417	233,405
Iron tank stock.....			4,306,882	5,064,507
Total stock.....	8,470,490	8,797,633	4,615,299	5,297,973
Number of producing wells.....	11,960	12,000	10,337	10,482
"    drilling wells.....	440	540	218	265
"    "    completed.....	261	320	175	136
"    "    dry holes.....	15	17	13	15
Aggregate daily production of new wells.....	4,200	4,850	2,170	2,099
Average.....	16 1/10	15	13 1/10	13 6/10
Number of rigs building.....	490	560	246	352
Total shipments out of the region.....	1,532,585	1,650,409	992,722	663,998

—Stowell's Petroleum Reporter.

The differences between the oil-producers and oil-carrying companies in the western part of Pennsylvania have been settled in the Supreme Court. On the motion of the Attorney-General, the bill in equity against the United Pipe Line and the Pennsylvania Company was dismissed. A. R. Campbell's suit for conspiracy against the Standard Oil Company has also been discontinued.

## FOREIGN PETROLEUM DISCOVERIES.

CANADIAN PETROLEUM LEGISLATION.—OTTAWA, Feb. 19.—Mr. Colby's bill to amend the petroleum act proposes to remove the present discrimination against American coal oil, by making the test more uniform. The test for Canadian oil will probably be increased, and that of American reduced.

Petroleum is found in Australia in large quantities, and of good quality. The Consul-General at Melbourne writes the State Department that several companies have been formed to develop the production of petroleum, found in large quantities, and of good quality, in various parts of the colony.

A dispatch from Berlin says that the borings in the Hanover petroleum region are now sixty feet deep, and the existence of a basin as large and rich as the one in Pennsylvania is regarded as beyond doubt by experts. The deepest borings already yield four hundredweight per well daily. The borings are exclusively in the hands of Hamburg and Bremen firms engaged in the American trade. Says the *North American*: "It may be well for all who are interested in the petroleum trade of Pennsylvania to be alive to the possible result of the reported petroleum discoveries in Hanover, because the German demand for oil is so great as to give employment to a large fleet of vessels at Philadelphia, Baltimore, and New York."

The *Montreal Gazette* says: "The wonder is, that the existence of the substance in Hanover was not long ago ascertained by practical mineralogists. Among the multitude of minerals in which Hanover has for ages abounded, the Hartz mountains being a natural storehouse of almost unexampled variety, bitumen, or mineral pitch, is of frequent occurrence."

## LABOR NOTES.

QUAKERTOWN, PA., Feb. 10.—Molders who received 5 per cent advance in wages on Saturday, have struck for 15 per cent.

YOUNGSTOWN, OHIO.—The monthly disbursements for wages by thirteen of the principal coal and iron companies is \$188,400.

CONNELLSVILLE.—There is a strike in the Connelville coke region, and it is more than likely that the next influence to be expected upon the trade will be such as is exerted either by a strike or a suspension—possibly both. The strike in the Connelville region is very general, though some few men may be at work. The coke operators are determined not to grant the advance. They say that the present price—thirty-five cents a wagon for mining and eighty cents and over for drawing—higher than were ever paid before, and that, when these prices were agreed upon, only four weeks ago, the men said they would make no demand for any further increase until May. The strike at the railroad mines also continues, and force has been used to keep out the men that were willing to work at 3½ cents. Some of the proprietors have shipped arms and ammunition to their miners, and told their men to defend themselves if attacked. The Railroad Coal Exchange of Pittsburg voted unanimously not to pay more than 3½ cents. Coal was offered to any of the members who needed any, but they were all pretty well supplied. The retail price is nine and ten cents a bushel for lump coal, according to the distance of delivery. 6¼ cents in flats on the river, and 7 cents on cars, at the Union yard. The Clearfield operators expect that the strike will extend and reach that region about the last of next week. It is known that delegates have been sent to the Cumberland region, the idea being to secure a simultaneous strike on the part of all the bituminous coal miners. The operators are not likely to accede to their demands, and will permit a suspension until the men yield or the market shows such an advance as will warrant the wages that the men ask.—*Philadelphia North American*, Feb. 14.

## PACIFIC COAST.

LEGISLATION.—Mr. Wasson, of Mono, California, has introduced a bill providing for "Courts of Conciliation," for the purpose of settling disputes between capitalists and laborers, with a view of preventing strikes. The author claims that this will be a simple and cheap method of settling a very difficult class of cases.

There appears to be a large supply of laborers in all of the towns and cities of the Pacific coast, at the present time. The contractor of the Nevada Central Railway experienced no difficulty whatever in securing the number of laborers he required, says the *Reveille*, even if the wages offered were much lower than the amount usually paid laborers in this State. A call was made in Virginia City, some little time ago, for thirty stone-cutters, and there were five hundred applicants in a very short time. At this season of the year, the demand for labor is not nearly as great as it is in the summer time, and it is to be hoped that, when spring opens, there will be a much greater demand than at the present time.

ENGLISH STRIKES OF THE PAST TEN YEARS.—An interesting paper on this subject has been read before the British Statistical Society by Mr. G. iPhillips Bevan. After remarking upon the great difficulty experienced in getting information as to strikes, Mr. Bevan stated that, so far as he had been able to ascertain, there had, during the last ten years, been 2352 strikes, distributed as follows: 1870, 30; 1871, 98; 1872, 343; 1873, 365; 1874, 286; 1875, 245; 1876, 229; 1877, 180; 1878, 268; 1879 (to December 1st), 308. Of these, the great majority took place against a reduction, or for an advance, of wages, and out of the total 2352 no fewer than 314 were in the coal-mining trade. Out of the total 2352, 473 have taken place in Scotland; while, in the list of towns in which strikes have occurred, Glasgow stands first with a total of 85 during the ten years, Leeds holding the second place with a total of 73. As to the duration of the strikes, Mr. Bevan, unfortunately, has not been able to ascertain the results in more than 1096 cases; but estimating the duration of the remaining 1265 at a week each, he arrived at the conclusion that during the ten years 9027 weeks, or 54,162 working days, have been wasted. As to the numbers engaged in, and the results of, the strikes, Mr. Bevan's information is still more imperfect. Only in 110 cases has he any ascertained facts to go upon, and in these, estimating the average loss of wages at four shillings per day, for five days a week, he arrives at a total loss in wages alone of £4,468,000. From these figures, some idea of the loss on the whole 2352 strikes may be gathered. Dealing finally with the question of what can be done to reduce the number of and diminish the loss from strikes, Mr. Bevan confesses to have little faith in arbitration, and counsels rather the creation of tribunals somewhat similar to the continental *Conseils des Prudhommes*, to which all labor disputes shall be referred.

RAPID RAILWAY CONSTRUCTION.—A correspondent of the *London Times* at Cabool said a few days since that the first passenger train had arrived at Sibi. The line has, so far, been completed at the rate of a mile and a third daily, a feat perhaps unequalled in the history of railway construction.—*Engineer*, London, January 23.

PROGRESS IN SCIENCE AND THE ARTS.

Technology.

**Mr. MacTear's Artificial Diamonds.**—Mr. MacTear, it appears, is not yet convinced that he has mistaken the nature of the substance which he alleged to be the crystallized form of carbon known as the diamond. He replies to Mr. Maskelyne's unfavorable report, the gist of which he gave last week, by expressing his surprise at the negative results reached by that gentleman, and declares that the statements made by him (Maskelyne) do not prevent him from affirming, in the most positive manner, that the material he has produced is veritably diamond. He further affirms that on the only two occasions that he tried the experiment, he was able to burn the small translucent particles in oxygen gas, and that he was able, with the greatest ease, by means of them, to scratch deeply both the amethyst and topaz. He concludes with the remark, "As I do not despair of convincing Mr. Maskelyne himself of his being, to say the least of it, premature in his conclusions as to the problem of the crystallization of carbon having been successfully solved; and as it has been accomplished by means very similar to those which, in the concluding paragraph of his letter [see last week's JOURNAL.—ED.] he suggests as being possible, I trust the scientific world will suspend judgment on the case until more ample evidence has been laid before it."

We present Mr. MacTear's reply, in order that we may not lay ourselves open to the imputation of prejudging his case without a full hearing; but it appears to us to be beyond the shadow of a doubt that the crystalline powder submitted to Mr. Maskelyne for examination was not diamond dust, if any one of the three tests to which he submitted it were properly performed; and concerning Mr. Maskelyne's competency as a mineralogist and reliability as a scientific investigator, no one has yet presumed to venture a suspicion.

**Dynamo-Electric Machines in Telegraphy.**—The Western Union Telegraph Company is announced to have lately taken the initiatory steps to dispense with the old, troublesome, and expensive chemical batteries which have hitherto been universally depended upon to supply the electrical current for telegraphic purposes, and to substitute in place of them dynamo-electric machines driven by steam. The desirability of effecting this change has long been recognized, and inventors have been busily at work upon the problem for years, but, as it appears, with only indifferent success up to the present time.

The importance of the innovation about being adopted by the Western Union Company will be apparent from an inspection of the following facts and figures: In 1873, this company sent 14,456,832 messages, at a cost of \$6,575,055. In 1879, the number of messages transmitted had risen to 23,079,106, and the cost had fallen to \$6,160,200. By reason largely of improvements in the construction of telegraphic apparatus, it further appears that, while in 1869 the cost of battery per mile of wire was \$1.17<sup>1</sup>/<sub>10</sub>, in 1879 the cost of battery per mile of wire had fallen to \$0.34<sup>1</sup>/<sub>10</sub>. By the introduction of the new plan of dispensing with the batteries, and supplying the electric current from dynamo-electric machines, it is confidently believed and declared that even this high economy will be considerably surpassed by a further reduction of cost equal to at least 50 per cent. We do not wish to be understood as implying that the public will be benefited in the least by the adoption of this or of any other improvements, past or present, by the great company that has hitherto held the virtual monopoly of the telegraphic business of the country; for the only thing that will bring this about will be the competition of a rival company strong enough to hold its own against the other; but the improvement has a scientific and practical interest that raises it out of the reach of such considerations, inasmuch as it promises to work a thorough and speedy revolution in the economies of telegraphy the world over. On this account, a few words relative to the improvement itself will be of interest.

The efforts hitherto made to supply electric current for telegraphic purposes, by using electric machines, were all alike in that they all sought to accomplish the object by using a single machine at high tension, and on this account they are believed to have failed of success. The new system, said to have been adopted by the Western Union Company, after a thorough test of its merits in San Francisco and in the battery-room of the company in this city, consists of "a number of Siemens machines, connected in series, and having their field magnets excited by a current supplied by a single Siemens dynamo-electric machine."

For the explanation of the details of the system in question, we must refer our readers to the columns of the technical journals. Three sets of these machines and engines are at present in use in the battery-room of the Western Union Company, and have given such satisfaction that a sufficient number are now constructing to entirely take the place of the batteries heretofore employed. What this means will appear from the statement that there are now on the top floor of the Western Union building 14,300 gravity battery elements, and in an adjoining building 4600 bichromate elements, all of which will, in a short time, be removed to make place for a dozen or more electric machines and engines driven by steam, relieving the battery-room floor of a weight of 60 tons, which is the difference of weight between the batteries and the new plant. The electric current for the telegraph, in other words, will be supplied in the future by the combustion of coal instead of zinc.

The success of this new and remarkable departure in the art of telegraphy is due to the inventive skill and genius of Mr. Stephen D. Field, of San Francisco, Cal.

**Inorganic Acids as Preservatives.**—H. Endemann, in the *American Chemical Society's Journal*, presents some observations concerning the antiseptic virtues of boracic acid, and the cause thereof. In the course of this article, he notices that many of the acids are powerful disinfectants, destroying the life of bacteria completely, even when present in small quantities. He was led, from this observation, to make experiments in the preservation of food (meat), in which he replaced the boracic acid of previous trials with equivalent quantities of other inorganic acids. He thus ascertained that the same favorable results could be obtained with these as with the use of boracic acid. The best results were reached by the use of phosphoric acid and mixtures of phosphoric acid and hydrochloric acid.

He notices that phosphoric acid, even in dilute solution, acts power-

fully on fresh meat, covering it speedily with a white layer of coagulated albumen, which, however, gradually disappears on standing. Where the phosphoric acid is partially replaced by hydrochloric acid, this precipitation either does not take place, or, if it does, the meat soon recovers its original appearance.

Meats thus treated are said to keep exceedingly well, at least fully as well as when preserved with an equal quantity of boracic acid.

Sulphuric, nitric, and acetic acids gave the experimenter less favorable results.

He found, on trial, that fresh beef, packed with 1 per cent of boracic acid, and a salt pickle of 50 per cent, remained sweet and wholesome for several months, even when the average temperature recorded 80° Fahr. Previously-salted beef, however, it was found, could not be preserved by the use of boracic acid, from which the inference was warranted that the salting removed from the beef certain substances in the absence of which preservation became impossible. These substances he proved, after further investigation, to be the phosphates. He draws the inference, therefore, that it was not the boracic acid which had been the cause of the preservation, but rather the substances which are produced by the action of the boracic acid—the acid phosphates. He is non-committal on the subject of the wholesomeness of food preserved with boracic acid.

Engineering and Miscellaneous.

**Another Northeast Expedition.**—Prof. Nordenskjöld, in a recent letter addressed to M. Sibiriakoff, one of the most liberal patrons of his previous expeditions, expresses his intention to undertake another expedition of exploration to the northern coast of Asia. His letter in question contains the following statements: "After my return, I think of spending a year in preparing an account of the voyage of the Vega, and it is my desire, then, to continue the exploration of the icy ocean along the coast of Siberia, making the river Lena the point of departure, and the New Siberian Isles the basis of operations. For the object I have proposed to myself—namely, the rendering of the northern part of Asia completely accessible to commercial shipping—the prosecution of these researches is of paramount importance."

**The Belgian Cable Towing System,** according to the recent report of the Auditor of the Canals of this State, is making progress. We referred at some length to this system in one of our earlier issues, as our readers will remember, presenting its advantages in a favorable light.

The report in question expresses gratification at the announcement that the company organized to equip the Erie Canal with this improvement is making substantial progress.

During the past season, we are told, ten additional tugs were constructed, and fifty-five miles more of cable were laid in time to operate the system from Buffalo to Rochester for a few days prior to the close of navigation. The Auditor is of opinion that there is now no room for doubt, if any before existed, as to the adaptability of this system to the Erie Canal, and that there is every reason to expect that by its means we shall secure much greater speed, at less cost, than by the old-fashioned system of animal towage. By the end of the next season, the managers of the Steam Towing Company expect to have the Erie Canal fully equipped, when the entire tonnage of the canal will be moved by steam.

**The Report of the Commissioner of Patents for 1879** gives the following summary of the business of the Patent-Office for the fiscal year ending June 30th, 1879:

Applications for patents.....	19,300
"    " design patents.....	697
"    " reissues.....	639
"    " registration of trade-marks.....	1,465
"    " labels.....	631
Caveats filed.....	2,074
Patents granted, including reissues and designs.....	12,471
Trade-marks registered.....	1,144
Labels.....	403
Patents withheld for non-payment of final fee.....	828
Total receipts of office.....	\$703,146.79
"    " expenditures.....	548,651.47

The Commissioner makes a number of excellent suggestions relative to the more effective working of the office, the most interesting of which is his recommendation to dispense with models in all applications for patents, except in cases where the examiner requests one on the ground that it will be useful in the examination. Such an enactment, it appears to us, is very sensible, as it would relieve the inventors of the country of an enormous tax for models that are often of no earthly use, except to still further crowd the shelves of the Patent-Office.

**The Millers' International Exhibition.**—An international exhibition of all kinds of milling machinery and appliances is to be held at Cincinnati, Ohio, commencing May 31st, 1880, and to continue for two weeks. It will be held under the auspices of the National Millers' Association, and, from the elaborate preparations that have been made for it, it promises to be the most complete and instructive exhibition of the kind that has ever been held.

One of the features of this exhibition that promises to be of special interest is the proposed test trials of automatic cut-off steam-engines, which will be conducted under the supervision of Mr. John W. Hill, an expert of high standing. A full code of regulations to govern the proposed trial, prepared by Mr. Hill, has been published, and is of such a character as to insure an impartial and thorough series of tests, which ought to yield valuable information concerning the latest improvements of the steam-engine. Six engines have thus far entered for trial, representing the products of the most famous engine-builders in the country, namely, the Corliss, the Wright, the Buckeye, the Brown, the Wheelock, and the Harris-Corliss.

**The St. Gothard Tunnel.**—The meeting of the two headings of the St. Gothard Tunnel is now expected to take place about the end of the present month or early in the next. This is somewhat later than recent announcements have led us to expect, and is explained on the ground that the progress of the work has lately been greatly retarded in consequence of an unresistant kind of rock having been met with, which exerted great crushing force upon the supports, and which interposed great difficulties before it was successfully passed. It is stated, for example, that during the 51 days intervening from the 11th of November, 1879, to the 1st of January, 1880, the progress made at the north heading was only 34.9 meters; whereas during the 49 days immediately preceding, the same heading was advanced 173.1 meters.









"Attention was first attracted to the camp by the large amount of gold brought to this town from there, on various occasions, by the few miners."

OREGON.

GATHERING GOLD ON THE SEASHORE.—The Portland Bee says: "The mining of gold on the ocean beach has always been one of the leading productive industries of Curry County. These mines have been found to pay, from the Coquille south to some distance below the mouth of Rogue River, and a large number of these claims are still good property. Not long since, some claims of this kind were sold for \$2000, and much higher figures have been offered for some of the other beach mines in that vicinity, says the Coast Mail. Among these may be mentioned the Ophir Beach mine, a deposit of black sand, on or near the beach, about five miles north of Rogue River. Mr. Will Huntly, the present owner, has constructed dikes, etc., that supply water all the year for working the beach below high-water mark. It pays from \$3 to \$10 per day to the land, and sometimes more, owing to the freaks of Neptune in throwing up the sand. The bluff mine is twenty-five feet above tide, and is an old beach, in which there is a stratum of sand from ten to twenty feet thick, that assays from \$1 to \$50 to the cubic yard. Experts who have examined black sand pronounce this the richest that they have seen in California or Oregon. There are from thirty to forty feet of gray sand above the lead, forming a bluff of from 75 to 100 feet above tide. During the winter season, Mr. Huntly runs the hydraulic under forty feet pressure, using fifty inches of water, five or six months of the year, doing all the work himself, and realizing from \$5 to an ounce a day."

It has been many years since the prospects for a prolonged gulch-mining season were better. The miners not only have an abundance of water now, but the deep snow in the mountains promises to keep up the supply until late in the spring. The rains of February and March will also be of great benefit, and we may expect that the miners will have a seven months' run.

UTAH.

PARLEY'S PARK DISTRICT.

The Empire Company has now at work in the mine thirty-one men engaged in sinking for the 400-foot level, and in running a drift from 300-foot station. Work has been greatly retarded on account of the extreme hardness of the rock. The Great Basin mine, first east extension of the White Pine, is being worked by a tunnel 200 feet long. Four men are at work, and it is expected that a large body of ore will be struck. It will tap the White Pine at a depth of 1000 feet.

The Marsac Mill has shut down, having completed its long run on tailings. The music of its batteries will be heard in the early spring, when needed repairs shall have been completed. It will work custom ore throughout the summer.

E. P. Ferry has commenced work upon his smelter, which will be completed in two or three months. The smelting ores of the White Pine, Utah, and Woodside will keep it busy as soon as it is ready for business.

The Sampson mine has, until lately, been lying idle on account of water. Recently the old hoisting works of the Empire were removed to the Sampson, and a force of men is now at work cutting a station at the 150-foot level, where a pump will be placed. From there, it is the intention to run for the ledge, cutting it a distance of 100 to 150 feet. The water is under control.

White Pine mine is working thirty-six men. The work of sinking for the 300-foot level will commence in a day or two. On the 200-foot level, the vein averages twenty-seven feet wide, between solid hanging and foot walls. In the ore-house, there are 500 or 600 tons of ore that will average \$75 per ton in silver and 30 per cent lead. During fifteen days in January, over 100 tons were raised.

WOODSIDE MINE.—The Park City Mining Record says: "A tunnel has lately been started, which will strike the vein at a depth of 250 feet, 300 feet in. Heretofore, the mine has been worked by a shaft, which is now too deep for further work until hoisting-works are erected. The tunnel is six and a half feet high, three and a half feet wide at the top, and four feet at the bottom. Last year, the owner shipped over \$10,000 worth of ore to Salt Lake, proving this to be no prospect, but a mine in every sense, with a true vein fully developed. Ten men are at work on the tunnel, and the vein will be reached and ore taken out by the time the smelter is ready for operation. A good blacksmith-shop has been erected at the mouth of the tunnel, and a boarding-house is on the premises."

FRISCO DISTRICT.

The Chicago and Frisco Consolidated Mining Company contemplates the erection of a smelter, at an early day, in or near Copper Gulch, near Frisco.

The concentrating works erected by Mr. Pascoe, of Salt Lake, for the Frisco Smelting Company, are a success, and concentrate the ore without trouble.—Salt Lake Tribune.

VIRGINIA.

The Fredericksburg News of February 16th says: "The purchase of the Whitehall gold mines, some months ago, by capitalists of Boston, Mass., has infused new life into mining interests in Spottsylvania. Several valuable mines have recently changed hands, and new companies have been organized. There are now four mines in operation in the region known as the Wilderness, and new shafts are being sunk at three other places. Some of the rock from the new shaft of the Chicago-Virginia mine has been assayed, and yielded \$30 per ton. The average of twelve samples was \$14 per ton. One of our bankers says that a large amount has been realized during the past year, from panning and sluice-washing surface dirt."

NEW PATENTS.

The following is a list of the new inventions relating to Iron, Coal, Mining Machinery, Chemical Apparatus, and the treating of Precious Metals, etc., from The Official Gazette of the United States Patent Office, for the two weeks ending Feb. 10th, 1880:

Table with 4 columns: No. of Patent, Title of Invention, Name of Inventor, Residence. Includes entries for Rotary Engine, Electric Telephone, Process of Manufacturing Fine Salt, Gas Stove, Electrical Water-Indicator for Steam-Boiler, Air-Compressor, Grinding and Amalgamating Machine, Hot-Blast Stove, Oscillating Engine, Process for the Manufacture of Sulphate of Soda, Chemical Fire-Extinguisher, Electric Speaking-Telephone, Rotary Engine, Tripod-Head for Leveling Instruments, Means for Transmitting Rotary Motion, Device for Transmitting Rotary Motion, Galvanic-Pump.

(a) Assignor to the Robert Gas Stove Company, of same place. (b) Assignor to himself and Edward A. G. Roulstone, Boston, Mass. (c) Assignor to Samuel S. Walls, Philadelphia, Pa. (d) Assignor to Guild & Garrison, same place.

Table of patent entries with columns for number, title, inventor, and location. Includes entries for Apparatus for Making Wells, Pump, Topophone, Apparatus for Supplying Fuel to Steam-Boilers, Manufacture of Carbonates and Bicarbonates, Production of Cold in Ice-Machines, Electric Deposition of Nickel, Box for Amalgamator Spindles and Shafts, Coal and Rock Drill, Apparatus for the Manufacture of Gas, Hoisting Machine, Galvanic-Battery Cell, Electric-Lighting Apparatus, Pump, Rotary Coal-Sifter, Galvanic Battery, Kiln for Burning Brick, Pottery, etc., Grinding and Pulverizing Apparatus, Attachment for Mechanically Connecting Hand-Telephones, Apparatus for Saving Float-Gold, Microphone, Galvanic Battery, Machine for Washing, Sizing, and Amalgamating Gold and Silver, Rock-Drill Bit, Rolling-Mill, Manufacture of Hydrogen Sulphide, Portable Engine, Steam-Boiler.

REISSUE.

- 9,061—Ore-Stamp Feeder. Thos. A. Cochrane (m). San Francisco, Cal. (e) Assignor to William Whittaker, same place. (f) Henry Y. Attrill, assignee of William Farmer. (g) Assignor to Walter N. Hill, trustee, Newport, R. I. (h) Assignor to Walter N. Hill, trustee, Newport, R. I. (i) Assignor to Eugene F. Phillips, same place. (j) Assignor to one-half of his right to C. Coles Dusenbury, New York City. (k) Assignor to himself, Oliver B. Keeley, same place, and Enos S. Shantry, Philadelphia, Pa. (l) Assignor to one half of his right to Thomas Taylor, same place; said Taylor assignor of one half of his right to William L. Reynolds, same place. (m) Assignor to Joshua Hendy.

PROPOSALS.

For the benefit of many of our readers, we compile weekly such proposals and solicitations for contracts, etc., as may be of interest. The table indicates the character of proposals wanted, the full name and address of parties soliciting, and the latest date at which they will be received:

Table of proposals with columns for description, name, address, and date. Includes entries for Purchase of Obsolete and Unserviceable Ordnance Stores, Building a Bridge, Tiling, Mantels and Hardware, Cast-Iron Water-Pipes, Board Office, To Dealers in Iron, Gray Granite Entrance Steps, Sewer, Purchase of Wrecked Light-Houses, Dredging the Manistee River, Alterations and Additions to State House, Leasing or Buying the Rolling-Mill and Furnaces, Finishing and Completing the New Court-House, Tenders for Construction of a Railway, Penrose G. Julian, Crown Agent for the Colonies, Water Gates and Fire Hydrants, Pumping Machinery, Dredging in the Patapsco River, Roof-Chain for the Great Kanawha River, Remodeling Engine-House, Grading, and all Work Embraced in Ballasting the Riviere-du-Loup Branch, Grading, etc., on the Quebec Central Railroad, Artillery Horses, Bridges.

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

This department is opened for the benefit of miners, prospectors, and others interested in minerals.

Replies will be made in these columns, and without charge, to questions asked regarding the nature and commercial value of minerals, and of samples sent.

Assays determining the actual composition and value of ores will be made at the following rates. All assays are made with the utmost care by the most experienced and competent assayers:

Table of assay rates: Assay for gold \$3.50, Assay for copper \$3.00, Assay for iron \$4.00, silver 3.00, lead (wet) 3.00, nickel and zinc 5.00, cobalt 10.00.

The amount should invariably accompany the order, and expressage or postage must always be prepaid.

Communications, samples, etc., to be addressed to ENGINEERING AND MINING JOURNAL, 27 Park Place, New York (P.O. Box 4404.)



GENERAL MINING STOCKS.

Dividend Paying Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val, Total levied to date, Date and amount per share of last), DIVIDENDS (Total paid to date, Last Dividend), HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE (Feb. 14, Feb. 16, Feb. 17, Feb. 18, Feb. 19, Feb. 20), and SALES.

Non-Dividend Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val, Total levied to date, Date and amount per share of last), DIVIDENDS (Total paid to date, Last Dividend), HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE (Feb. 14, Feb. 16, Feb. 17, Feb. 18, Feb. 19, Feb. 20), and SALES.

Total Assessments levied to date..... Total Dividends paid to date..... Total Shares sold during the week.....

The Bodie Consolidated Mining Company has declared a dividend of 25 cents per share, payable March 1st.

The Argenta Mining Company, of the Tuscarora (Nev.) District, has declared a dividend of 20 cents per share.

The Empire Gold Mine, Utah, has declared its first dividend of five cents per share.

SAN FRANCISCO MINING STOCK QUOTATIONS. Daily Range of Prices for the Week.

Table of San Francisco Mining Stock Quotations. Columns include Name of Company, Closing Quotations (Feb. 13-19), Opening (Feb. 20), and a column for 'Sales'. Lists companies like Alpha, Alta, Argenta, etc.

REVIEW OF THE SAN FRANCISCO MARKET.

The Comstocks still continue to decline, and while there is no end to rumors of strikes, favorable indications, and prospective resumption of dividends, yet the market fails to respond, and we can not but view the situation as an ominous one.

Argenta closed yesterday at \$1, which is a slight decline from previous prices. This company is making very satisfactory shipments, and if the public had any confidence in the management of the mines in this district, quite an advance should follow.

COAL STOCKS.

Table of Coal Stocks. Columns include Name of Company, Capital Stock, Shares (No., Par Val., Last Dividend), Rate per Ann., and Quotations of New York stocks (Feb. 14-20) based on Philadelphia prices.

\* Of the sales of this stock, 61,252 shares were sold at the Philadelphia Stock Exchange, and 11,200 at the New York Stock Exchange. † 103%.

BOSTON MINING STOCKS.

Table of Boston Mining Stocks. Columns include Name of Company, Quotations (Feb. 13-19), and Shares. Lists companies like Allouez, Atlantic, Atlas, etc.

vanace in the stock. Belcher is steady, with a tendency to lower prices. Chollar, in sympathy with the market, is lower. It is said that three feet of very fine-looking quartz have been found in the west drift, 2400 level, of this mine.

Northern Belle closed yesterday at \$16, a decline from the prices quoted a week ago. This company is shipping 80 tons of ore per day to its mill, and it is anticipated that it will soon be in a position to resume dividends.

respond contrarily. The superintendent of the Sierra Nevada Company states that the winze from the 2300 level has encountered an ore-vein which is said to be rich. This strike has been made 900 feet north of the Union Consolidated ground.

During the week ending February 15th, there were sold in the Baltimore Stock Exchange, 950 shares of Ore Knob Copper Company, at 4 3/4 @ 4 1/2, and 100 shares of Sutro Tunnel at 3 3/4.

Copper and Silver Stocks.

Reported by C. H. Smith, Commission Stock Broker, No. 15 Congress street, Room 3.

The week under review has been one of considerable activity and wide fluctuations, especially in the low-priced copper stocks, which have begun to feel the "boom" in prices hitherto confined in a great measure to the producing and dividend-paying mines.















**BERNHARD VON COTTA.**

Born, October 24th, 1808. Died. September 14th, 1879.