

ENGINEERING and MINING JOURNAL.

VOL. XXIX., No. 5. (WITH SUPPLEMENT.)

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SUBSCRIPTION PRICE, including postage, for the United States and Canada, \$4 per annum: \$2.25 for six months; all other countries, including postage, \$5.00 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

REMITTANCES should always be made by Post-Office Orders or Bank Drafts on New York, made payable to THE SCIENTIFIC PUBLISHING COMPANY.

THE SCIENTIFIC PUBLISHING CO., PUBLISHERS,
27 Park Place, New York.

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AMERICAN INSTITUTE OF MINING ENGINEERS.

The annual meeting of the Institute will be held in New York City, beginning on the third Tuesday (17th) of February, 1880.

Messrs. A. S. HEWITT, J. A. BURDEN, A. L. HOLLEY, R. W. RAYMOND, and CHARLES MACDONALD will act as a local committee of arrangements.

A subsequent notice will give the place of meeting and other particulars. Members are requested to give early notice to the Secretary of papers to be read at the meeting.

The annual dues to the Institute (ten dollars) are payable in advance at the February meeting. THOMAS M. DROWN, Secretary.

SECRETARY'S OFFICE, LAFAYETTE COLLEGE,
EASTON, PA., Dec. 26. 1879.

Will some one in a position to do so furnish us, for a correspondent, with the "bottom" facts as to the future of Independence?

PROF. GEORGE W. MAYNARD left here Thursday night for Colorado. His address up to February 8th will be: Teller House, Central City, Colo.

J. E. BLOOM has opened a Bureau of Mines, where all the business usually done by such an institution can be transacted. His references embrace a number of the best firms familiar with mining.

OUR familiarity with the subject leads us to expect a reply from the friends of water-gas to the communication of Mr. VANDERPOOL, published in this number of the JOURNAL, and to believe that his arguments are not conclusive.

THE excess of exports over imports of merchandise for the twelve months ended December 31st, 1879, was \$251,350,477, against \$305,279,590 in 1878. The excess of imports over exports of gold and silver coin and bullion in 1879 was \$67,372,392.

WE publish this week a testimonial to our San Juan (Colo.) correspondent, who has pricked numerous bubbles blown in that district, while, at the same time, he has called the attention of capitalists to the worthy

properties. The certificate of the prominent citizens of his district only strengthens the opinion of him previously held by us.

THE tone of the after-dinner speeches at the Bullion Club on Tuesday night, as well as the attendance, indicated that much more confidence and interest had developed since the previous annual dinner. This club has been of vast importance in calling public attention to the mining industry, and in many ways has been of service not only to the miner, but to the investor.

THE San Francisco *Commercial Herald* of January 15th appears with a very exhaustive review of the stock and financial markets, trade, commerce, and productive industries of the Pacific coast. The care and labor devoted to this and past annual reviews is not excelled by that of any other journal, and they make a complete exhibit of all that has been done in financial, commercial, and productive circles during the several years, as well as indicating the true condition and prospects of affairs at the end of the years.

A SYNDICATE has been formed, composed of the following gentlemen, who have organized the Metropolitan Fuel-Gas Company: PHILIP KISSAM, representing WILLIAM ASTOR; EDWIN D. MORGAN, WILLIAM WALTER PHELPS, ABRAM S. HEWITT, JAMES S. PINCHOT, A. S. BARNES, H. B. HYDE, HENRY DAY, WALTER E. LAWTON, SIDNEY A. STEVENS, and several other capitalists. This company has secured the exclusive right to the Strong process for the city of New York, deriving their right from the American Gas-Fuel and Light Company, of which latter company Mr. M. H. STRONG, the inventor, is president, and Mr. WILLIAM B. BUCK, secretary. It is gratifying to announce the fact that the process advocated by the ENGINEERING AND MINING JOURNAL meets with the recognition it deserves, and that the people are in a fair way to reap the benefit of this great improvement.

THE BULLION CLUB DINNER.

About eighty members and guests sat down at the second annual dinner of the Bullion Club, at its rooms, No. 19 West Twenty-fourth street, on Tuesday night. It was a very enjoyable affair, and a feast for the mind as well as the stomach. Mr. D. J. CROLY, the Secretary of the Club, presided in his usual graceful manner. Mr. PRENTICE MULFORD responded to the toast, "The Old Forty-Niners," and called attention to the fact that, with the decline of the cost of supplies, the industry of mining grew in importance and respectability. Of course, he dwelt largely on whisky, which first sold at 50c. and finally declined to 15c. per glass, and which was one of the greatest of "necessities" to the "forty-niner." Ex-Governor FULLER, of Utah, followed, and said he was agreeably surprised at finding that the Bullion Club was not a soup-house. He spoke of the growth of the San Francisco Stock Exchange, of which he was one of the organizers, and the advance of the price of seats from \$100 to \$40,000 each; of the beginning and growth of mining in Utah. Mr. BRAYTON IVES dwelt on the value of exchanges; while Mr. GEORGE B. SATTERLEE followed with a history of the operations at the Mining Exchange, and the position now held by that institution, also expressing clearly the probable future of the mining business of this city.

Ex-Governor LATHAM, of California, reviewed the growth of the mining industry, and stated that during the next twenty years it would be very large; and that our production of the precious metals would be greatly increased. The Hon. J. W. GERARD discussed the disadvantages of our incorporation laws. Mr. JOHN SWINTON believed in producing gold and silver, but was not fully satisfied as to its future distribution. Several other gentlemen made remarks on mining, and the evening was finally ended with "Leadville Piety," read by Mr. W. S. ANDREWS, with the effect of thoroughly digesting the dinners of those familiar with life in new mining camps.

GREAT BRITAIN'S EXPORTS OF IRON.

From the circular of W. W. & C. RICHARDSON, of London, we take the tables, given on the next page, prepared by them from the government returns.

The exports of railway iron show a gain, as compared with last year, but a falling off, as compared with 1877. Were it not for the increased demand from the United States, the showing in 1879 would have been even less than in 1878.

The total of exports of all classes of iron and steel to all countries makes a very favorable showing, the increase over 1878 being 583,024 tons, and over 1877, 533,514 tons.

The exports to the United States show the most remarkable changes. In the items given above, there is an increase of 489,094 tons over 1877 and 498,728 tons over 1878. This large increase has been brought about mainly by a scarcity of iron and higher prices in this country. Tin plates show a very marked increase, which indicates that their uses have greatly increased, as we depend almost entirely on Great Britain for our supplies, and at the end of the year our stocks were not such as to indicate that

shipments were made for speculative account or on consignment to a greater extent than usual.

RAILWAY IRON EXPORTED TO—	12 MONTHS ENDING DEC. 31ST.		
	1877.	1878.	1879.
	Tons.	Tons.	Tons.
United States.....	2,525	681	44,998
Russia.....	84,548	59,887	38,487
Turkey.....	309	422	1,030
British India.....	105,825	104,221	88,142
British North America.....	36,318	34,614	64,423
Egypt.....	1,002	2,914	2,957
Australia.....	84,783	75,407	55,049
Brazil.....	24,196	15,447	31,913
Holland.....	952	116	8,114
Spain and Canaries.....	20,569	24,828	14,321
Sweden and Norway.....	61,856	23,692	14,331
Chili.....	999	1,411	803
Denmark.....	3,635	5,044	5,046
Peru.....	1,308	3,539	2,950
France.....	155	88	114
Germany.....	23,459	37,005	3,500
Belgium.....	122	226	28
Italy.....	9,799	18,982	36,767
Other countries.....	35,926	30,868	50,062
Total.....	498,256	439,392	463,035
Total exports from Great Britain of iron and steel to all countries.....	2,346,370	2,296,860	2,879,884
Estimated total of iron rails.....	177,852	107,268	55,604
" " steel rails.....	235,453	251,491	328,425
Total of rails.....	413,305	358,759	384,029
Exports of the following to the United States:			
Pig-iron.....	35,953	32,663	276,998
Old iron for re-manufacture.....	3,167	1,888	177,842
Steel, unwrought.....	6,263	4,905	9,305
Tin plates.....	106,593	108,123	155,795
Hoops and sheets.....	5,079	1,021	10,456
Bar, angle, bolt, and rod.....	5,877	4,698	21,630
Total.....	162,932	153,298	652,026

MINES OF THE WHITEWOOD MINING DISTRICT, BLACK HILLS.*

From an elaborate report by Mr. LOUIS JANIN, one of the highest authorities in the profession of mining engineering, and especially in that branch of it which deals with the examination of mines, we obtain some interesting and trustworthy statements concerning the economic geology of the region in question. Mr. JANIN corroborates Messrs. JENNY and NEWTON in their views of the local geology. The nucleus of the Black Hills, according to their report, consists of a belt of metamorphic rocks, mica-schists, slates, and quartzites of Archæan age, which extends nearly the entire length of the Hills. This belt is completely surrounded by encircling layers of subsequent geological formations, which have a general dip from the center to the level plains which surround the Hills.

The mica-schists and slates are set on edge, and are metamorphosed throughout their length. The slates rest unconformably, in places, upon the schists, and are supposed to be of a later age. The mica-schists occupy the southern portion of this belt, and the slates, chiefly chloritic, the northern portion. It is in this portion, the chloritic slates, that the auriferous quartz veins occur. The length of the belt of auriferous slates is about 50 miles, and its width is from 6 to 25 miles. Its course is with the general course of the Hills, and the slates dip to the northeast at a varying angle. The mica-schists to the south of the auriferous slates are traversed by dikes of granite conformably to their stratification, but the age of these granitic dikes is yet undetermined. On the other hand, the auriferous slates, especially in the immediate vicinity of the mines described by Mr. JANIN, are traversed by numerous dikes of a buff-colored feldspathic porphyry, also conformable to the stratification, and more recent in age than the Cretaceous deposits. There are a number of veins in the northern part of the Hills which may have resulted from the intrusion of this porphyry; but the auriferous quartz veins of the Whitewood Mining District are older than the porphyry, and were probably caused by the folding of the slates and the metamorphic action which resulted therefrom.

Along the length and breadth of the area of auriferous slates, there are still broad stretches of overlying sandstone of the Silurian age, followed immediately by deep deposits of carboniferous limestones. These have escaped the erosion to which the Hills have been subjected, and it is due to their presence, perhaps, that so few gold-bearing districts have been found. Wherever the slates have been uncovered, some veins of quartz are likely to be encountered; and as the system of drainage has been across the course of the slates, it is not surprising to learn that gold has been discovered in nearly every cañon or water-course that leads out of the Hills.

Mr. JANIN remarks that the northern portion of the Hills has other veins of the precious metals besides the quartz veins in the slates. There are veins of argentiferous galena in carboniferous limestone, accompanied by sulphurets and chlorides of silver; veins containing gold and silver in the

* Report on some of the Leading Mining Claims of the Whitewood Mining District, in the Black Hills, Lawrence County, Dakota. By LOUIS JANIN, M.E. Printed for the shareholders of the Homestake, Giant & Old Abe, Highland, Golden Terra, and Deadwood Mining Claims. San Francisco, 1879.

Silurian sandstone, and also veins carrying gold in the porphyry itself, and in contact with porphyry and sandstone, or porphyry and limestone. There are extensive overflows of porphyry, which have more or less gold distributed throughout the mass. There are placer claims and cement-beds, and also ridges of auriferous gravel that need only an abundant supply of water to be worked to advantage.

Many deposits of iron are known to exist; and in the Cretaceous beds adjoining the Hills are seams of coal which promise to be of importance.

The Whitewood Mining District, containing the towns of Deadwood, Lead City, and Central City, and embracing numerous placer, cement, and quartz mines, is the most important in the Black Hills. The predominant country rock of this section of the great auriferous belt of the Hills is, as Mr. JANIN says, chloritic slate. This slate preserves its general characteristics throughout a wide extent of country, but there are a number of local variations, especially in the immediate neighborhood of the veins. There may be seen numerous bands of siliceous, micaceous, talcose, chloritic, horn-blendic, and clay slates, irregularly alternating. A still more striking division of the slates is into bands which are highly-colored by the presence of ferruginous oxides, which are found in immediate contact with other bands, still retaining the greenish tint due to the presence of chlorite, and carrying undecomposed crystals of iron and arsenical sulphurets. It is probable that much of the difference existing in these bands of slates is owing to the difference in the materials existing at the time of deposition; but other changes must have resulted from the metamorphic action due to the folding of the slates, and from those causes which led to the formation of the veins.

The trend of the slates is to the west of north, and they dip at an angle of about 51 degrees to the northeast. Notwithstanding local variations, this dip is remarkably constant.

Before the occurrence of that period of erosion which led to the present configuration of the surface, the slates were covered with sandstone, limestone, and overflows of porphyry. We have remnants of the former in patches or local depositions, and of the porphyry in the *débris* which covers the ridges and the hillsides to varying depth. We find also a number of reefs of siliceous slate which outcrop boldly above the surrounding country. These reefs are seamed with veins of quartz, both large and small, and, being of a harder material than the accompanying slates, they have withstood the erosion to a better degree. These are the "quartzites" of the miners. They are found on either side of the mineral belt, at some distance apart, but generally parallel to the veins, and are held by some to indicate the outer limits of the slates wherein the ore deposits may be found; and miners—whose conclusions are often worthy of attention, although their theory may be at fault—anticipate as much benefit to the veins from the neighborhood of these reefs as California miners do from the presence of greenstone dikes, and probably for the same reason, namely, because a number of good mines have been found in their immediate vicinity.

Beneath a covering of sandstone and its overlying porphyry—sometimes resting on the quartz veins themselves and sometimes in depressions within their immediate neighborhood—we find a number of auriferous cement beds of varying thickness.

These beds consist of a highly ferruginous conglomerate of quartz and fragments of slate and of sandstone firmly cemented together, and carry a variable amount of gold. The beds were formed from the abrasion of the pre-existing quartz veins by the waves of the sea which rolled over the Hills in the Silurian period.

These cement beds have yielded a considerable amount of gold. Some claims are even now being worked to a profit, and the ore is crushed and treated in the same manner as ore from the veins. A limited quantity of the ore has yielded as much as twelve to fourteen dollars per ton, but the average result has been about seven or eight dollars to the ton. The gold is sometimes, but not usually, visible in the ore. Its occurrence in the beds is very irregular. Its fineness is much higher than that of the vein gold; and this difference is supposed to have resulted from the action of sea-water upon its alloy of silver.

The placer claims of this district are not worked now to any extent. They are situated along the gulches and on Deadwood and Whitewood Creeks, and mining is generally confined to the few months in the year when water is abundant in all the streams.

Passing through the slates in bands of varying thickness, and covering the prominent elevations of a long stretch of country, we find that highly siliceous feldspathic porphyry which has already been mentioned. This porphyry occurs in dikes which have fissured the slates along the line of stratification, but have altered neither their strike nor their dip. These dikes are found in immediate contact with the veins, and even separate some veins from one another; but it is difficult to determine what influence, if any, they have had upon them; whether, in fact, they have caused a subsequent enrichment of the vein or not. The dikes near the veins

carry no metals, although the porphyry of the neighboring districts is metalliferous.

The "Mineral Belt" is a vague term sometimes applied to the entire width and length of the auriferous slates, sometimes to that breadth of the entire width wherein the quartz veins, or bands of interlaminated slate and quartz are found, and again, in a more restricted sense, to that line of ore-deposits whereon the leading mining claims are situated.

This belt (excluding that neighboring line of deposits on which the Caledonia group of mines is situated, and most of which is buried beneath porphyry or sandstone) extends through Lead City and Central City, and is traced at intervals beyond these points, both northerly and southerly. There is work being done on the Pierce and other claims to the south of Gold Run, and on the Erin and Roderick Dhu to the north of Deadwood Creek; but all the main developments are still confined to that section of the belt which commences with the claims of the Homestake Company, on Gold Run, and ends with the Father De Smet Company, on Deadwood Creek. This section of the main channel of ore—about one mile in length—is owned and worked by various companies.

The width of the channel of ore-deposits has not been fully determined. In the neighborhood of the Homestake claims, but separated by stretches of barren slate and dikes of porphyry, there are a number of veins over a breadth of 2000 feet of the country. The main portion whereon the best mines are located is, however, much narrower, and seldom exceeds 600 feet in width. Within this limit, the belt consists of a series of ore-deposits included within bands or zones of slate which are roughly parallel to one another. The workings of the companies are still near the surface, and here the different ore-bearing zones of slate are easily distinguished by their special characteristics, although they have certain features in common. They are sometimes separated by an intervening mass of barren slate, and sometimes the workable ore in one zone includes its entire width, and comes almost in contact with a similar deposit in an adjoining zone; yet their boundaries are plainly discernible. Even the miners notice the difference, and speak of the "green slates" and the "red slates"—that is, the chloritic slate and the highly ferruginous mica slate. The sulphurets in the former are less decomposed than in the latter, in which the iron occurs chiefly as a hydrated oxide; but in each there is a considerable amount of magnetic iron.

These bands or zones alternate across the breadth of the belt; but they do not all continue with equal length. Some of them seem to thin out and to be replaced by others.

Mr. JANIN thinks it doubtful whether so sharp a distinction will exist between the zones when depth is attained, and the effect of weathering is less perceptible; but he finds nowhere any evidence as yet of one zone gradually losing its characteristics and merging into another, either in length or depth; some line of demarkation seems always to exist.

The ore-deposits take, in some places, the form of true fissure-veins of quartz, parallel to the stratification, and carrying free gold and gold-bearing sulphurets, and in others, the deposits occur in bands of interlaminated quartz and slates. As depth is attained—or even along the length of the vein—one large body of quartz may branch into separate seams of interlaminated quartz and slate, or several small veins of quartz may widen into a larger mass; but the ore-deposits of one zone do not seem to unite with the ore-deposits in another. The walls of the ore-deposits or veins are likely to become sharply defined in depth, and the slates will be more siliceous.

The slates, zones, and ore-bodies have all the same general course of from 10° to 30° west of north, and the same general dip of from 40° to 60° to the northeast.

The gold is remarkably free, and is worked to a higher percentage than the gold in California ores; but the sulphurets (pyrite and mispickel) which carry in California \$50 to \$300 per ton, are here worth but \$5 to \$12 for iron sulphurets and \$20 to \$35 for arsenical sulphurets. The free gold seems to have come from these sulphurets, yet the "free ore" is usually richer than the concentrated sulphurets. On the other hand, the richest ore yet worked has come from the lowest levels, though the percentage of sulphurets increases in depth. The paradox is, however, more apparent than real. The free gold is usually finely divided; but some of it occurs in threads. Its fineness, as obtained in bullion from the mills, is 800 to 850.

Mr. JANIN says that the extraordinary width of the veins (10 to 100 feet and upward) gives a great abundance of ore, yielding an average of \$7 to \$9 (sometimes \$10 or \$12) per ton, and lying above the tunnel levels and near the surface, so that the question how the veins will behave in depth need not be at present considered. He considers this range to be one of the most extended and uniform lines of gold-bearing deposits known in the history of mining. It is not like the auriferous deposits of the Pacific slope, but resembles rather those of the Appalachian belt, though none of the latter have yet been found to equal it in mass, uniform productiveness, and value.

THE STORMONT SILVER MINES, SILVER REEF, UTAH.—IV.

With Supplement.

THE BUCKEYE MILL.

The Buckeye or Pioneer mill, belonging to the Buckeye property, is situated at a distance of one and a half miles by the road from the mines, its location having been selected as central to several very promising mines on the southern portion of the reefs. While this position may have been advantageous as a general custom mill, it certainly is not so for the Buckeye property; for it now costs \$1.50 per ton (which, however, might be reduced to \$1 per ton) for hauling ore from the mines to the mill. On this account, and because of its small capacity and defective arrangements, this mill, notwithstanding its remarkable record, can not be said to have any great value to the owner of these mines.

The following details give an idea of the mill. It consists of 3 head of stamps, 750 pounds, which make from 80 to 100 drops per minute, with a fall of 5 inches.

The battery can readily crush an average of 6 to 7 tons per 24 hours to the head of stamps—say 20 tons a day. The limiting point in this, as in every other mill in the camp, is an insufficient pan capacity. The pulp from the battery runs, as is usual, through tanks where the ore is deposited. This is next chloridized wet in 6 pans 4' 6" diameter and 5' 8" deep, the shaft in which revolves at half the speed of the battery. The charge in chloridizing varies somewhat with the nature of the ore; but it is about 4 per cent of salt, 1½ lbs. blue-stone, 1¼ lbs. mercury, and 1½ lbs. commercial (65°) sulphuric acid; or for slimes, 6 per cent salt, 2 lbs. blue-stone, and 1 to 1½ lbs. sulphuric acid. The charge remains six hours, and is then run into the amalgamators, which till recently were exclusively Freiberg barrels; now one pan has been introduced to replace a barrel which it was found to be almost impossible to keep tight.

The amalgamation lasts six hours, and the charge is about 2500 lbs. of ore. This charge is next run off into the settlers, where it remains three hours. The motive power for the mill is furnished by an engine 12"×18" steam-cylinder, and two tubular boilers, one of which is sufficient to supply the steam required.

The loss of quicksilver in the amalgamating and retorting exceeds 1¼ lbs. per ton.

Previous to August, 1878, the battery ran only twelve hours per day, and the capacity of the mill was ten tons a day.

A considerable quantity, from 10 to 15 per cent, of the silver contained in the ore goes out in the slimes, which are re-worked with the ore-pulp from the battery.

The supply of water is quite sufficient for the mill.

THE STORMONT MILL.

The Stormont or Rock Cliff mill, situated on the Rio Virgin, about five miles from the mines, is unquestionably the best mill now working Silver Reef ores. It is provided throughout with new plant and machinery, manufactured by Messrs. FRASER, CHALMERS & CO., of Chicago, whose experience and acknowledged preëminence as manufacturers of this class of work are sufficient guarantee of its quality.

The mill is about 650 feet lower than the Stormont mine, and as there is little or no fall in the first mile, this elevation would have to be overcome in about three and a half or four miles—a grade which would be very inconvenient, though not impossible, in a railroad. The mill is run by means of a 48"-diameter turbine-wheel, abundantly supplied by the waters of the Rio Virgin, which are collected by a low dam across the stream one and a half miles above the mill, and conducted through an extremely well-built canal to the mill, where they have eighteen feet of head to the turbine. The mill has ten head of 650-pound stamps, which work with a fall of six inches, and make 75 to 100 drops per minute. The ore is broken in a Blake crusher (two men working twelve hours), and then falls on to the battery platform, where it is fed to the stamps by two men (twelve-hour shifts). A self-feeder would save the labor of these men, and would cost but a few hundred dollars to put in. The battery discharges through forty-mesh screens, and can easily crush seven tons per day, if the pan capacity were sufficient to amalgamate it. From the battery, the pulp runs into twenty-four settling-tanks (two men on eight-hour shifts), and from these is charged into ten pans of five feet diameter and a capacity of one and a half tons each. These pans are run nearly six hours, treating four charges per twenty-four hours. They deliver into the five settlers, which are eight feet in diameter. These run about half as fast as the pans, and the charge remains in them two and a half to three hours. The tailings run through six blanket-slucies 130 feet long, 14' wide, 5' deep, with an inclination of 3°.

The pan charge is, for twenty-five ounce ore, about one and a half per cent salt, two pounds (and sometimes up to five pounds) sulphate of copper, and about 1.13 pounds of mercury; a bucketful of wood-ashes or a

little cyanide of potassium is added to counteract the effects of candle-grease.

The steam for the pans is supplied by a tubular boiler forty-eight inches diameter and twelve feet long.

There are two twelve-inch iron retorts, capable of holding 1000 pounds, the usual charge of which is 700 pounds.

Wood costs eight dollars a cord, as against seven dollars at the mine. Mercury costs fifty cents per pound; salt, thirty dollars per ton, as against about twenty-eight dollars in Silver Reef. Teams are hired at five to seven dollars per day, including driver.

The Silver Reef ores are of fair grade, when the small cost of treating them is considered. The following data, taken from the books of the several mills working in the camp, give

THE AVERAGE YIELD OF SILVER REEF ORES.

The ores shipped from this camp previous to the erection of mills were necessarily of very high grade—averaging probably \$150 per ton. After the erection of mills, much of the ore was mined by tributers, who paid the mills very high milling charges, and were, consequently, obliged to sort the ore to a very high grade. This is shown by the record of the Buckeye mill, where the average for sixteen months' work (4849 tons) was 44.98 ounces per ton, and where there was actually obtained, in net cash, \$47.40 per ton of ore milled.

An equally high grade was milled in the Rock Cliff (Stormont) mill previous to August, 1878.

Since the Stormont Company commenced working its own mines, a much lower grade of ore has been treated; for, while about one fourth of all the bullion produced came from high-grade custom-ores, the average net yield of 9893 tons milled was 20.63 ounces per ton; or, allowing that 86 per cent of the assay value was obtained, the ore contained on an average 24 ounces per ton.

The Barbee mill treated about 5740 tons of an average assay value of 29.10 ounces, and obtained net fine silver in the bullion 23.22 ounces per ton of ore.

The Leeds Company, in 1878, milled 12,064 tons of an average assay value of 19.42 ounces, and which yielded, in bullion, 15.11 ounces of fine silver per ton of ore.

RECAPITULATION.

	Tons milled.	Value of bullion produced in ounces fine per ton.
Buckeye Mill, February, 1878, to January 1st, 1879.....	4,849	44.98
Stormont Mill, September, 1878, to May 1st, 1879.....	9,893	20.63
Totals and averages.....	14,742	28.64

From this we see that the average actual yield in fine silver of all the ores milled by these companies, and which nearly all came from their own mines, was 28.64 ounces per ton; or, allowing for a loss of 15 per cent in milling, the ores contained an average of 33.70 ounces per ton. The ores milled previous to the date mentioned in this statement were of much higher grade, being mostly tributers' ore.

In assuming an average value of ore to be milled hereafter as 20 ounces per ton, I am far within the average of what these mines have produced in the past, and am providing for obtaining a much larger tonnage from the same area of ore-bearing beds, and at a much less cost per ton for mining.

Allowing a loss of 13 per cent in milling, which is justified by present practice in some of the mills, and a cost of \$10 per ton for mining and milling, which is fully \$1 per ton above actual present cost in some cases, 20-ounce ore, at the present price of silver, would yield at least \$10 net profit per ton. Should it be desired at any time to increase temporarily this profit to \$12, \$15, or even \$20 per ton, it can easily be done by sorting the ore more closely, and thus bringing its average value up nearer to the average heretofore attained. I believe, however, that the permanent interests of the company will best be served by milling a considerable proportion of that low-grade rock which is now thrown away after being mined, or is left unmined as waste.

From this it will be perceived that the average actual yield, in fine bullion, of 14,742 tons of the Stormont ores treated was 28.64 ounces per ton. Since August, the average yield has been quite as high as ever before.

THE COST OF MILLING STORMONT ORES.

There were treated in the Christy M. and M. Co.'s mill, between January 1st, 1878, and May 1st, 1879, 14,248½ net tons of ore, of the average assay value of \$32.86½, or 25.42 ounces of silver, per ton. The tailings averaged \$4.47½ per ton. The per cent extracted was, therefore, 86.38. The bullion obtained amounted to an average of 21.45 ounces fine per ton—equivalent to 84 per cent of the silver in the ore—and about 2.38 per cent went into the slimes now on hand, and which will be reworked. The expenses of milling this ore are shown in the table which follows.

Labor and salaries.....	Per ton	\$2.85
Blue-stone, 2.1 lbs. at 15c.....		31
Mercury, 1.22 lbs. at 48.09c.....		58
Salt, 25.8 lbs. (?).....		51
Fuel (wood, coal, and charcoal).....		1.31
General supplies.....		87
Hauling.....		73
Contingent and legal expenses.....		41
Total.....		\$7.57

COST OF MILLING AT THE STORMONT MILL.

	Ore milled, Tons.	Bullion produced, Ounces fine.	Per ton, Ounces fine	Net cash received per ton.
1878.				
September, October, November, December, 1879.	3,739	88,376.08	23.39	
1879.				
January.....	1,607	25,940.10	16.14	
February.....	1,335	26,107.28	19.55	
March.....	1,827	39,592.87	21.67	
April.....	1,385	24,017.94	17.34	
Total.....	9,893	204,044.27	20.63	\$21.00

Or, allowing that 85 per cent had been obtained, the ore averaged over 24 ounces per ton.

AVERAGE EXPENSES PER TON MILLED.

Labor and salaries.....	Per ton	\$2.97
Blue-stone (CuSO ₄), 1¾ lbs.....		26
Mercury, 1.13 lbs.....		57
Salt, 20 lbs.....		29½
Wood and charcoal.....		45½
General supplies.....		45
Incidentals.....		12
Total.....		\$5.12
Hauling.....		2.58
Mining.....		8.27
Total.....		\$15.97
Improvement account, mine.....		1.13
mill.....		2.97

COST OF MILLING BY THE LEEDS COMPANY.

The Leeds Company, in 1878, milled 12,064 tons of an average assay value of 19.42 ounces, and which yielded, in bullion, 15.11 ounces per ton, equivalent to 79.41 per cent of the silver in the ore. The expense per ton of milling was as follows:

Labor and salaries.....	\$2.20
Material.....	3.15
Hauling.....	.32
Assay Office.....	.07
Total.....	\$5.74

During the six months ending December 31st, 1878, this total expense averaged \$5.05 per ton; but during the present year, this has been further reduced to the following figures:

Labor.....	\$1.82 4	The chemicals used per ton of ore were about:
Material.....	2.61 0	
Sundries.....	05 6	
Hauling.....	26 9	
January—Total.....	\$4.75 9	2 lbs. blue-stone.
February.....	4.77 6	1¼ " mercury.
March.....	4.11 9	20 " salt.
April.....	3.82 8	A little cyanide or concentrated lye or wood-ashes.
General average.....	\$4.37 0 per ton	

From these figures, we are quite justified in stating that Silver Reef ores not only can be treated in a large and economically-managed mill situated near the mines, at \$4.50 per ton, but are now being treated at that figure.

The reports from the superintendent of the company's mines continue to be of the most favorable character.

In our next, we shall summarize the condition, prospects, etc., of this enterprise.

AN INSINUATION REFUTED.

The following was printed in several of our San Juan (Colo.) exchanges, in justice to one who has had the true interests of that district at heart, and who knows that the only true course to be followed to bring about a development of its mineral resources is an honest one:

"With reference to a communication to the Ouray Times, signed 'Justice,' which reflected on the ability and truthfulness of W. Weston as a correspondent of the ENGINEERING AND MINING JOURNAL of New York, we, the undersigned, hereby state that W. Weston came into this camp in June, 1877, and since that time has, with his partner, been engaged as a working miner in the Sneffels District, and has also been special correspondent to the last-named paper for the same period. We have read his letters and heartily indorse all he has said, and have every confidence that what he will say in the future will be as correct as hitherto. His character for integrity, industry, and fearless truthfulness is well known in San Juan. He holds a certificate as assayer from the Royal School of Mines, London, and we consider him one of the best judges of mining property in the camp.

"Theron Stevens, County Judge; M. S. Corbett, Mayor; I. Y. Munn; Francis Carney, A. B. Cooper, G. A. Scott, Board of County Commissioners; A. E. Long, County Clerk; W. W. Stoddard, County Treasurer; George S. Andrus, H. W. Reed, T. W. Hammon, John L. Meyer, H. Dunton, A. W. Richardson, William McGaughy, A. G. Siddons, H. G. Corson, and J. R. Letcher.

"The above indorsement, coming as it does from our best citizens and without any knowledge on the part of Mr. Weston, who is absent in Imogene Basin, is certainly deserving. Mr. Weston is strictly an honorable and reliable gentleman, and we sincerely hope that Mr. Henry Ripley, the editor of the Ouray Times, will in the future cease to allow the col-

umns of his paper to be used by every scrub who chances along. We know that the class we allude to are Mr. Ripley's friends, but friendships such as these in which duplicity is the condition, submission the tribute, and dishonor the sacrifice, are not commendable."

THE OUTLOOK ON THE PACIFIC COAST.

Special Correspondence of the Engineering and Mining Journal.

The old year has gone, but not so the doubt and uncertainty that it brought. The late falling off in prices, amounting in the aggregate to many millions of dollars, has had a very depressing effect, not only directly upon mining speculations, but indirectly upon all industries. With the opening of the year, the new constitution went into effect. Some of its measures are so extreme that it will be difficult for a time to know just what results will follow their enforcement. The appointment of the Railroad Commission will, no doubt, be of great benefit to the State in the regulation of freights and other tariffs. The Land Commission can adjust taxes in a way to satisfy the masses. The most difficult point to cover is that of dealing in mining stocks. The law provides that no stock shall be bought or sold on margins; and as the business has always been conducted heretofore on this basis, it will be necessary to arrange some means of getting around it, or closing this branch of business, which, of course, the brokers do not intend shall be done. Dealing in stocks has been the rage for so many years that the masses find it almost impossible to rid themselves of this habit, which they admit to be of the most exciting character, and simply another form of gambling.

Now, with the rapid depreciation of this class of securities, loans have been called in from every direction, and a newer and much lower schedule of values on the whole list of stocks has gone into effect. Add to this the fact that, instead of going at once for the kernel of the "North End" bonanza, the Comstock managers are just cracking the shell wherever they feel inclined, and levying assessments to pump water and carry on dead-work at other points where they are not ready as yet to let outsiders into a knowledge of their developments. These long lines of assessments, amounting in the aggregate to over \$15,000,000 for the whole Pacific slope, and \$9,000,000 for the Comstock alone, have produced a very demoralizing effect upon all parties, notwithstanding the cry is, that 1880 will be a golden year in mining.

The writer, realizing that there must be some good reasons for the existing general depression, started out on a prospecting tour to see if it were possible to gain some bottom facts.

The first person interviewed, a prominent banker, said: "The new constitution, which contains a clause making all purchases of stock upon margins illegal, and the act punishable by a heavy fine, had much to do with the present state of affairs; and that, while it was possible to evade the law, a feeling of uncertainty in the community would naturally restrict transactions. Other questions of vital importance, which it is claimed the constitution settled, would undoubtedly need readjustment by the present and future Legislatures; and these questions would naturally be left more or less open until such readjustment. Confidence in mining or other investments could not be restored for some time under these conditions, and I do not look for any great immediate improvement."

Another, a broker doing a heavy business, explained the situation by laying the blame at the door of the Comstock managers. Said he: "The ring have held control of the market so long, and have manipulated affairs so much to their own profit, that they are loth to loosen their grasp or to give up their deadly grip on the public and private coffers. They die hard, but die they must. The absorption process—the rich growing fat on the hard earnings and careful hoardings of the poor—is about at an end. Some other game must be invented to catch the savings of those whose eyes are at last opened to the evil practices of adroit schemers."

Another gentleman, well posted in mining matters, remarked: "Much of the mine management of the Pacific slope is rotten to the core. I could, if I would, tell how such men as the bonanza kings had made their money, by owning the water-rights and timber supplies upon which the mines were dependent, and for which they were forced to pay extravagant prices; how, in their own mills, they had treated the ores, some too low to pay a profit to the companies, in order to make large dividends for themselves, they being paid so much per ton for reduction; how a wasteful process was continued, so that the slimes and tailings, containing sometimes over 20 per cent of the precious metal originally in the ore, might pay them handsomely, no matter what the loss accruing to the mining companies. I am convinced that this waste material, rightfully the property of the mine stockholders, would eventually pay the mill-owners, by whom it was now being worked over, many millions of dollars. If this was not stealing, I do not know what other term would apply to it."

Another gentleman, engaged in manufacturing machinery, said: "The custom of paying a commission to superintendents and mine managers by the San Francisco foundries was very objectionable, and was bearing its legitimate fruits. The moment a single official of a mining company stoops to the position of accepting a bribe, his employés feel that they are entitled to their fees as well, and all control over them is gone. The matter of placing contracts through favoritism is proving very detrimental to mining interests. It is not always the best machinery that is sent to the mines; but oftentimes that which will make the most show for the money expended. When such practices are common, fraud and deception are the order of the day. Robbing from stockholders to divide large profits among rings made up of personal friends and sinecurists is one of the worst features of the mining management of the Pacific coast."

Whatever the truth of these statements may be, it is nevertheless a fact that some of our best mining companies, those that are already, and those that are soon to be, dividend-paying, are moving very rapidly their headquarters to New York City. This leaves the more speculative stocks on this coast, some of which have very little intrinsic value.

You may expect to hear from us at various points along the line, as we journey across the continent.

SAN FRANCISCO, Jan. 8.

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SAN JUAN SILVER MINES.

Special Correspondence of the Engineering and Mining Journal.

Our hitherto good friend, the ENGINEERING AND MINING JOURNAL, has seriously offended; that is to say, a bone is sticking in the craw of a large number of your subscribers here, which you can easily remove, and I trust will.

It is affirmed that, outside of my own letters, not a word has ever been published in your paper in favor of San Juan, and that, in two instances, it referred to this region as "the lair of the wild-cat," and "the inaccessible mountains of San Juan."

In a paper exerting such a marked and wide-spread influence in the mining world as yours is now known to do, such statements, though undoubtedly to a great extent true, do us incalculable injury; and there are statements which might be made and ought to be made, in conjunction with, and as an offset to, the former, and, by these not being made, we are done a grievous injustice.

We have a country wonderfully rich in the noble metals; we have thousands of rich gold and silver prospects; but we, the owners, are poor as Job's turkey, and have been hanging on to our claims year after year, in poverty and hard work, waiting for Eastern capital to come in and help us develop; and now, when there does seem a likelihood of our getting it, such remarks as those complained of are really terribly bitter pills to swallow.

That the wild-cat has brought forth a large litter in San Juan, there can be no denying; but, thanks to the cold water thrown on them by the ENGINEERING AND MINING JOURNAL, the kittens were drowned before their eyes were fairly open, and the only harm done is the very trifling stigma connected with the fact that the beastly "varmint" selected this region as the place of her accouchement. If people will only reflect, however, it will be seen that this latter fact is the very proof of the richness of our country. Why have the wily promoters selected San Juan as the base of their operations? I will tell you. They know that their worthless prospect-holes and snide properties will be gilded with reflected luster from the thousand and one rich mines and prospects which our country really does possess; and for this reason invariably select the very richest regions.

The fame of San Juan's riches is now known all over this continent, and the inexperienced in mines and mining, who at present form a very large proportion of those investing, on reading the catchpenny prospectus, see that the property described is in San Juan, and at once conclude that it must be valuable.

I therefore maintain that the very fact of San Juan being the "lair of the wild-cat," is a genuine proof of the richness of the region.

The plenitude of money and prosperity of a frontier mining camp may generally be measured by the number of its gamblers and dance-houses, and so may the mineral wealth of an undeveloped region be known by the number of its wild-cat operators.

Now, as to the inaccessibility of San Juan: From Alamosa, a station on the Denver & Rio Grande Railway, to Ouray, via Del Norte and Lake City, Barlow & Sanderson are running a daily stage line—coaches as far as Lake City, and stages thence to Ouray. Passengers for Silverton can also travel by the same line of coaches as far as Antelope Springs. The above line is running winter and summer. From these points in summer-time, you can ride a horse up to the dumps of most of our well-known mines. Contracts are let, and the work going on for the building of the Denver & Rio Grande Railway to Animas City, 35 miles from Silverton; that 35 miles being traversed by a wagon-road, which has, I hear, been also bought by the Railway Company. From Silverton to the Sneffels, Poughkeepsie, and Uncompahgre districts, and the town of Ouray, by trail, and part of the way by good roads, the distance is from ten to sixteen miles. This railway is to be completed this coming summer, and I can then ride my pony from where I am now mining, in the Sneffels District, to the end of the track in one day. The work of extending the Denver & South Park Railway into the Gunnison country, eighty miles from Ouray, is going on, and, it is said, will be completed this coming summer. All this doesn't look very "inaccessible," does it?

To some, of course, San Juan is entirely inaccessible. For instance, to the old gentleman of magnificent stomach and 200 pounds avoirdupois, who must needs have his bed warming-panned on retiring, and a brandy and soda on rising; reed-birds on toast for breakfast, *pâté à foie gras* and such like muck for lunch, and a skillfully-mixed drink at each and every hour—to him it may be inaccessible, and it ought to be. If he can afford the above luxuries, I don't see what he wants to come to San Juan for. Such necessities are only bred by the possession of wealth; and if he must have more wealth, let him obtain the services of a reliable and well-known expert to go to San Juan for him.

I climbed up to some mines, last summer, at an altitude of over 11,000 feet above sea-level and 4000 feet higher than Ouray, with a gentleman fifty-nine years of age, who had just come from Pennsylvania, and it didn't seem to distress him either. But then he didn't hanker after reed-birds as long as he could get beef and potatoes; and he hadn't a car-load of adipose tissue to pack up-hill. People of all ages and both sexes, invalids and the healthy, from infants in arms to those seventy years of age, are continually coming into and going out of our San Juan mining towns. Where, then, is the inaccessibility?

That our mines are comparatively inaccessible in the winter, I admit; and what silver mines in new districts are not? I once purchased for a man in the East a good prospect here. It cost him less than had been expended on it in work. During the winter, I had to explain to him that my mail facilities were somewhat "seldom," as I had to make the trip to Ouray and back on snow-shoes, the trip being invariably accompanied by danger from snow-slides. This egregious ass wrote me that "he was sorry to hear his mine was situated in such a snow-bound region." I then had to explain that, as I supposed, silver was exposed to mortal ken by upheaval of the earth's crust; that upheaval meant lofty mountains and deep fissures in them; that those fissures were subsequently filled with minerals, and became what is known as silver-bearing veins; that to find these, you must go up into the lofty mountains; that if you go up into the clouds, you must expect an unlimited supply of snow in winter and rain in summer; that I did not then know of any silver mines situated in

verdant agricultural and pastoral valleys in the suburbs of some large city, where I could work in my tunnel all day, and then get into dress clothes and take my young woman to the opera in the evening; but that when I did hear of such a place, I would let him know.

All frontier mining camps must be comparatively inaccessible. Thank goodness, it is so. If it were not, I could not have come in here a poor man and stuck my stakes on good claims. If there was a railroad to our doors, prospects now worth hundreds would then be mines worth thousands, and there would not be the same chance for the investment of individual capital.

San Juan is yet a region of marvelously rich prospects, and only half prospected at that, and is alike a grand field for the poor man and prospector as for the wealthy individual; but with two railroads into our midst, it will not be many years before it will be closed to both and open only to the immense capital of corporations.

A careful study of the records of all mining countries convinces me that, for surface indications and facilities for working, San Juan is the richest in the known world. Three years ago, it was estimated here that, in twenty miles square, six thousand claims (300 x 1500 feet) had been located; and since then, thousands more have been recorded.

I have in my scrap-book an article copied from the *St. Louis Times-Journal*. It appeared some time last autumn, and was written by a gentleman who was sent out by the Royal School of Mines, of England, to report on the most noted camps of America. He visited old Mexico, New Mexico, Arizona, Nevada, Black Hills, Leadville, Silver Cliff, Utah, Georgia, South Carolina, and the San Juan country. Here is what he says: "My next and last place of examination was the great San Juan mining country. This is, without doubt, destined to be the future great mining camp of the world. Here the mountains for twenty miles square are interlaced with great fissure-veins running in all directions, that are traced for miles, and the outcrop of ore upon the surface is wonderful. In all my travels and observations throughout the world, never have I seen such a richness and display of ores upon the surface. Nature has truly made these mines the wonder of the nineteenth century." I regret to say that his name was not given in the paper from which I cut the article.

OURAY, COLO., Jan. 14.

MONTANA MINING NOTES.

Special Correspondence of the Engineering and Mining Journal.

The Alta Mining Company, by its unusually broad and liberal policy toward its employes, is securing men of the very best class. The Thanksgiving dinner tendered them has already been alluded to. They have further supplemented this kindness by presenting 500 shares of the capital stock of the company as a Christmas present to each of the following employes, namely: Charles S. Sterrett, foreman; Ernest Grenier, consulting engineer and metallurgist; Charles E. Stevens, assistant metallurgist; Philip M. Saunders, assayer; and Lyman Rowley, mining engineer. These men were greatly astonished and proportionately pleased. Such treatment is unusual, to say the least, on the part of mining companies. This company has also purchased the Comet mine, situated a few miles from the smelter at Wickes. It is considered here a most important mining transfer. The consideration paid the owners, Messrs. W. C. Child, John and George Russell, Dr. Glick, and O. J. Saulsbury, is not made public. There is every probability that this valuable mine will not be allowed to remain idle any longer, but that the Alta Company will push its further development with all the means at its command. The vein has great width, carrying sixty (60) per cent lead and sixty (60) ounces silver, and offers every facility for cheap development and reduction. Ore to the value of \$50,000 has been selected and sent to Utah, with a profit, over and above all expenses, including costly transportation hundreds of miles by wagons, and hundreds more by rail. There are now 6000 tons of low-grade ore on the dump. This and other property represented by the \$800,000 capitalized stock of the Comet Company now passes to the Alta Montana Company, which takes possession at once. It is the purpose of the purchasers to erect concentrating works on the spot, and afterward transport and smelt the product at Wickes.

Mr. Cole Saunders, Superintendent of the Alta Montana Company and Bonanza Chief Mining Company, left this city a few days since for the East, for the purpose of purchasing a 40-stamp mill, pumping machinery, and all necessary appliances for a speedy development and working of the Bonanza Chief mine. He expects to visit Colorado and the Black Hills, and to observe and examine the workings of the great quartz deposits in Leadville and the Black Hills, they being similar to the deposit of the Bonanza Chief mine.

The A. M. Holter lode, located on Elk Creek, in Jefferson County, is developed by an incline 6 x 8 feet to a depth of 149 feet, well timbered, and has a double track to run cars for hoisting ore. The ore is free-milling, and averages about three feet in the vein, and carries from 200 to 500 ounces silver per ton. A fine body of richer ore was struck on the 120-foot level. Mr. Hallbeck has built a good ten-stamp mill on the spot, and in a few days will begin to run again; work was stopped some time since by reason of some difficulty with the hands, and I can not say if it will run regularly again.

The Algonquin Mining Company, of Phillipsburg, is a new organization, composed of Philadelphia (Pa.) capitalists. The officers are: H. A. Stiles, President; F. H. Williams, Secretary and Treasurer, with principal office at Phillipsburg, M. T., and branch at 209 South Third street, Philadelphia; the capital stock is \$2,000,000, divided into 20,000 shares, at \$100 each. The company owns the Algonquin lode, 1000 feet; the Belle, 1500 feet; the Estill, 800 feet; the Salmon, 600 feet; and the Cliff No. 2 Extension, 600 feet. The Algonquin lead has a shaft sunk to the depth of 350 feet; the Salmon, 125 feet; the Cliff Extension, 100 feet; and the Estill, 70 feet. All these mines are on the same vein, which is situated on the granite, in the contact between it and the lime, the granite being the hanging-wall. The Algonquin lead has plenty of water in it, but the rest are as yet dry. The vein is very wide and strong, the ore occurring in irregular bodies in the ferro-manganic vein-matter, and is a quadruplex sulphuret carrying silver, copper, lead, and zinc, and

averages about 100 ounces of silver to the ton. This company has just finished the erection of a 40-stamp mill, which it claims is the best appointed mill in Montana. There is no doubt but that there are grounds for this belief, as no expense was spared in making the mill as complete as possible. Messrs. Griffith & Wedge built the mill machinery, and it reflects no little credit upon their ability as mill builders. Mr. Thomas W. Fisher is the designer and architect. The engine is the largest and costliest in Montana, and was built by Hoff, Fontaine & Abbott, Philadelphia, Pa.

The mill proper of the company is built upon granite walls, with a bed-rock foundation. The amalgamating-room is furnished with six (6) Union California pans. In the furnace-room is the huge Howell & White roaster, the chloridizer. It has a daily capacity of 35 tons. The drier-floor has a heating surface of 25 x 40 feet, and the plates weigh over 1000 lbs. each. The Blake crusher has a force of 7000 lbs., and is further supplemented by two grizzlies, which will enable it to meet all demands made upon it. In these and other respects, the mill and buildings are as complete as the fertile brain of the efficient superintendent, Mr. J. K. Pardee, could devise, and the result of the starting up of this mill, January 1st, is anxiously awaited by the whole community. There is no doubt that it will be a success, and such a result will, in an immense degree, affect the future prosperity of the whole camp.

The amount of gold and silver, in the shape of retort, bars, and dust, handled at the United States Assay Office, Helena, during the month of December, 1879, is as follows, namely:

	Ounces.	Value.
Gold.....	808.20	\$12,656.66
Silver.....	1,757.63	2,068.49
Total.....	2,565.83	\$14,725.15

During the month of December, 1879, there was purchased at the United States Assay Office, Helena, \$12,331.09 worth of gold bullion for coinage on government account.

BOOKS RECEIVED.

- Linkages: The Different Forms and Uses of Articulated Links.* By J. D. C. De Roos. New York: D. Van Nostrand. 1879. 18mo, boards. (No Index.) Price, 50 cents.
- Theory of Solid and Braced Elastic Arches: Applied to Arch Bridges and Roofs in Iron, Wood, Concrete, or other Material. Graphical Analysis.* By William Cain, M.E. New York: D. Van Nostrand. 1879. 18mo, boards. (No Index.) Price, 50 cents.
- Elements of the Mathematical Theory of Fluid Motion. On the Motion of a Solid in a Fluid, and the Vibrations of Liquid Spheroids.* By Thomas Craig, Ph.D. New York: D. Van Nostrand. 1879. 18mo, boards. (No Index.) Price, 50 cents.

THE WASTE OF ENERGY IN THE PRODUCTION OF WATER-GAS.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I notice, in your JOURNAL of January 20th, the so-called review of my paper on "The Waste of Energy in the Production of Water-Gas," to which the attention of your readers was directed by your editorial of January 13th. There are but two points reviewed worthy of attention. As the official data respecting these points have been heretofore submitted to the public by your reviewer, and entirely confirm my position, I briefly give them. First, as to the anthracite coal required to make 1000 cubic feet of water-gas by the Lowe process: Your reviewer refers to the practical results obtained at Phoenixville and Utica.

You will find in a pamphlet entitled *A Communication on the Lowe Gas Process*, on page 36, a letter to G. S. Dwight, Esq., by the superintendent of the Phoenixville Gas-Works, where the Lowe process had been in practical use more than two years: "With 1/2 ton of coal and 64 gallons of oil, we have made 15,000 feet." The weight of a gallon of crude petroleum calculated from specific gravity .878—see table of Haswell; also J. K. Clark—is 7.3 pounds. Therefore, to produce 15,000 cubic feet of gas required 1120+467=1587 pounds of coal and oil, the weight required to produce 1000 cubic feet being 1587/15=105.8 pounds. At Utica, page 29, same pamphlet, is taken the work done in the month of September, which is the best month's work of the five months ending December 31st; the works being destroyed in January. To make 3,050,600 cubic feet of gas, required 203,035 pounds of coal and 69,182 pounds of oil—272,217 pounds in all; the weight required to produce 1000 cubic feet being 272,217/3050.600=89.2 pounds. The more satisfactory figures, because covering a longer period of time, are the official ones of the Utica Gas-Light Company of the working of the Lowe process, for the five months ending December 31st, being:

Pounds of coal used.....	1,063,277
" " oil "	368,231
Total.....	1,431,508

Lowe gas made 15,225,500 cubic feet; weight required to produce 1000 cubic feet, 1431508/15225500 = 94.03 pounds. More recent official statements of the Lowe process confirm these figures, namely, six months ending March 31st, 1878, working at Trenton Gas-Works, to produce 1000 feet of gas were required 123 pounds of coal and oil; and at Toronto, for the seven months ending September 30th, 1879, were required 98.49 pounds. There are several elements wanting to absolutely determine, from the above data, the weight of coal required to make 1000 cubic feet of water-gas (non-illuminating) by the Lowe process. Among them may be stated: *The volume of the oil-gas in the mixture*, the quantity of fuel—it has been asserted that none is required by the Lowe process—to decompose this oil, and the quantity of carbon from the oil that may assist in the decomposition of the water. These elements are more or less determined in other methods of making illuminating water-gas, but can not be transferred from one process to the other, as the conditions under which the gas is made and carbureted are so different. By no system of fair calculation can it be shown, from the practical results quoted above, that the water-gas, separate from the volume of oil-gas, was produced by an expenditure of less than 75 pounds of coal per thousand cubic feet. As far as I know, there are no authentic records of the production, in every-day work, of 1000 cubic feet of pure water-gas

by an expenditure of less than 75 pounds of anthracite coal. The possibilities in this direction are fully shown in my paper.

Second. As to the heating power of the water-gas: It is shown by your reviewer, in the *ENGINEERING AND MINING JOURNAL* of August 30th, 1879, that 1 cubic foot of coal-gas is equal to 2.20 cubic feet of water-gas, and I am inclined to believe that, practically, the difference in favor of coal-gas is still greater. The commercial effect of this fact is so evident to the gas-makers that it need not be enlarged upon. I might also mention the point criticised, as to my unfairness in estimating, on October 9th, 1879, that anthracite coal would probably advance in a few months to \$4.50 per ton. By turning to your quotations in the very issue in which the review appears, I find that the anthracite coal used in water-gas works is already \$4.50 per ton alongside in New York. If the winter had not been unusually open, it would unquestionably have been higher. I would say, in closing, that the largest water-gas works in the world are in the city of New York, erected by one of the most competent and renowned mechanical engineers in this country, who is well versed in the construction and manipulation of coal-gas works. This engineer has had the assistance of men of the highest scientific attainments, with unlimited capital to carry out his ingenious ideas; and the manufacture of the gas has been superintended by a most capable, energetic, and intelligent man. *The official working results of this company for an entire year* have just been made public. I would refer to them as a complete proof of the essential correctness of my estimate of cost, to which, with other matters, I would refer your readers as a complete vindication of my paper.

In conclusion, allow me to say that there are several misstatements in the review, some germane to the matter, and others not; but the remainder of it is entirely unworthy of notice; indeed, were it not that some of your uninformed readers might be misled, I should have passed the whole of it unnoticed. As it is, I drop the matter here.

NEWARK, Jan. 26.

EUGENE VANDERPOOL.

SAN JUAN (COLO.) MINING NEWS.

Special Correspondence of the Engineering and Mining Journal.

The past month in San Juan, as we are credibly informed, has been the most wintry of any December since the settlement of the region. Storm succeeding storm, with brief intervals of clear weather, the snow now lies in huge drifts, where heavier accumulations have not been made by hideous avalanches. The winds have been uncommonly severe, and mails have been less regular than ever before. To crown all, we at Eureka have been denied all communication with the outside world, by the total abandonment of postal service upon our local route for the last two months. To get letters or to send them, we have now to make a dreary trip of eight miles upon snow-shoes, and as most of the mail is unfortunately sent in by way of Animas Forks, one must pass through a wild cañon most of the way, the very nest of dangerous snow-slides. Even the mines under one's charge may be out of reach for a week at a time, and our little tunnel in the rock has recently been extended by a snow-tunnel through a vast drift that has blocked the entrance. These are vicissitudes that try the souls of men, and yet no happier or more contented mortals can be found anywhere than those now working under our direction high above the timber-line.

I am meditating a weary journey down the river to the line of extension of the Denver & Rio Grande Railroad, near the New Mexican boundary, from which district I hope to glean something of interest to your readers. Since my last, my field of vision has been restricted to a rather limited area, with Eureka as a center. In this immediate vicinity, almost nothing is doing this winter, except the operations of the Niagara Consolidated Company. We are prosecuting our work as rapidly as circumstances will permit, although we have to contend with the very toughest of all tough quartz and porphyry. The main cross-cut tunnel has divided the Tabor lode, striking the farther or hanging-wall within a dozen feet of the entrance. A lateral drift eastward upon the vein now extends a few feet along a streak of quartz two feet in width, inclosing ore of fair quality diffused and in narrow seams. The minerals thus far exposed are *galena*, *tetrahedrite*, and *chalcocopyrite*.

Between Eureka and Animas Forks, some work is going on, principally at the Belcher mine, in Picayune Gulch. So far as I can learn, the cause of the stoppage at the Inter-Ocean mine was some local difficulty concerning contracts, and in no way connected with affairs at the Chicago office of the company. It is claimed that the work will be resumed in early spring.

In the neighborhood of Animas Forks, there is considerable activity, but by no means as much as the existence of *twenty-seven* mining companies would seem to warrant.

Later.—The very heavy snow-storms of Christmas week have so blocked the Animas Cañon that the trip referred to above was prevented, causing also a week's delay at Silverton. Some Eastern visitors who were active in the purchase of mines in San Juan last summer have braved the winter's terrors, and are now doing their best to gain further knowledge of our resources, in behalf of eager investors.

There seems now some prospect of a railroad into Silverton before next winter. The Denver & Rio Grande, under Jay Gould's energetic management, is pushing rapidly westward to the Animas River, and advertisements are out for laborers to work "between Alamosa and Silverton." As no newspaper mail has been received in San Juan since the arrival of a Denver *Tribune* of December 10th, we must guess at the news.

The greatest activity in mining matters now prevails in Poughkeepsie Gulch, where a number of companies are working large forces of laborers. Colonel Lewis, from Chicago, is in charge of development of the Pittsburg and Last Chance mines. The Alaska Consolidated Company's four mines are being worked under the direction of a brother of Lieut.-Gov. Tabor; Mr. A. A. Hard, the former manager, having retired. The Saxon and Red Rogers are also under Mr. Tabor's supervision.

A pond in the neighborhood, dignified by the title of Lake Como, is being drained and tunneled, in the hope of getting at a rich deposit of silver ore, supposed to lie on its bottom, on account of rich dredgings which have been obtained.

Perhaps I may be pardoned for referring here to a little venture of my

own, in the form of an eight-page monthly, to be known as the *San Juan Expositor*, the first number of which is nearly ready to issue.

The Ouray Discovery and Mining Company perhaps deserves from me a few words in this place, as I have felt called upon to criticise it mildly in the *JOURNAL*, and again in the *Expositor*. I have reason to think that its officers are well-meaning men, who believe all they announce in their prospectus, and their *prospects* near Eureka are not to be despised. Nevertheless, the plan and the proposed management of the company are open to serious objections, which experts and experienced managers would at once raise against the probable success of the enterprise. I am told that the stock has been sold as high as \$150 (par value, \$100 per share). It is also stated that a reorganization is proposed. Until this is effected, it will be wise to say but little of the present scheme; but one suggestion is given for what it may be worth, which it will pay well to heed. It is simply this, that a little advice from some competent authority may be found valuable enough, eventually, to more than pay its cost. We have already too many wrecks of fine "paper schemes" in this region, not to make the lesson one of value, if rightly read.

It would be most instructive, if one could prepare an authentic record, something after the following plan:

NAME OF COMPANY.	ORGANIZATION.	RESULT.
1. PANTHER ROYAL...	Capital \$5,000,000. Manager, a very successful grocer. Mines very favorably described by a noted clergyman.	Stockholders all know that mining is a "lottery."
2. WILDEST FELINE...	Officers all strictly honest. Owner of mine says, "This is the opportunity of a life-time." Managed by the youngest son of the president, a good boy. Certificates of character from leading divines.	"Isn't it strange how uncertain these investments are?" "Ore, the best in the region, but it won't pay to work."
3. RECONSTRUCTED...	Disinterested reports from well-known experts. Economical management by one who has seen a mine or two. Ore of very low grade, hard to work.	"What a bonanza they must have struck, and no one thought the mine would ever pay expenses." "Strange enough!"

A case within my own observation may serve as the type of a class. Some mining properties, wholly undeveloped, were begging for a purchaser last summer. The price set by the owners was less than \$1500 for the whole. A traveler, unfamiliar with mines and mining, visits the claims, and being much impressed (as all novices are with bodies of the lowest-grade galena), offers the same in Eastern markets for the neat little sum of \$25,000. Queries: How much can investors afford to pay for an examination by some reliable authority? How many innocent stockholders must be duped in order to float a company based upon such a purchase? Are such transactions, in their results, fair tests of the character of an industry? Even these sales are often made by honest and innocent parties; but how much comfort will such assurance probably afford to the ignorant, confiding victims?

Within eight days, the mercury has shrunk twice to -20° Fahr., and once to -30° Fahr., figures which might have been quoted also once or twice before this winter. We may expect a very late opening of the next season, as more snow has already fallen than in whole winters for several years. Between five and six feet is the depth of our portion *in toto*, and we now have at least four feet on the level; and in some places the slides have accumulated masses from 75 feet to over 100 feet in depth, packed as hard as rock, with yawning crevices of great extent, forming veritable glaciers in our cañons. Few serious accidents have occurred, owing to the horrible warnings by the cruel deaths of previous years.

THEODORE B. COMSTOCK.

EUREKA, SAN JUAN CO., COLO., Jan. 2.

MINING LAWSUITS.

The Denver *Republican* of January 16th says: "Mr. J. A. Dun, of the No Name mine, in the United States Circuit Court, yesterday, instituted suit against the Consolidated Caribou Mining Company for ejectment and the recovery of damages to the amount of \$160,000."

The San Francisco *Bulletin* of January 8th says: "LEGAL CONTEST FOR MINING LAND.—The Bunker Hill Discovery Mining Company has entered suit in the Superior Court, to-day, against the Standard Consolidated Mining Company, to obtain a decree that the defendant holds in trust for plaintiff the Bunker Hill mining ground in Bodie Mining District, Mono County, being one thousand feet in length, together with all the dips, angles, and spurs."

The Pennsylvania RR. Company has closed the Mercer & Somerset Railroad, and will remove the rails from Millstone to Somerset Junction, a distance of 23 miles.

The Philadelphia & Reading RR. Company is making a survey to connect New Hope (Pa.) with the Bound Brook route. By building 12 miles additional road, another route to New York via Flemington, N. J., and over the New Jersey Central RR., would be furnished.

OLD MEASURE.—One of the most ancient local measures still in use in England is described by the Board of Trade in a recent report prepared for Parliament. The measure referred to is the Miners and Brenners' Dish. Under the Derbyshire Mining Customs Act of 1852, the dishes or measures for lead ore for the wapentake of Wirksworth and manor of Crich are to be adjusted according to the brazen dish deposited in the moot-hall at Wirksworth. The dish is stated to contain about 14.047 imperial pints. It is of rectangular form, and bears an inscription setting forth (*inter alia*) that "This Dish was made the IIII day of October, the IIII yere of the Reign of Kyng Henry the VIII, and that it is to Remyne in the Moot-Hall at Wirksworth, hangyng by a cheyne, so as the merchants or mynours may have resort to ye same at all tymes to make the true measure after the same."

BUCHANAN'S UNIVERSAL CRUSHER.

The rock-breaker shown in the accompanying illustration embodies some features which are novel, and for which are claimed great advantages in efficiency. In the sectional sketch, *A* represents the main frame, *B C* the two jaws, *D* the crank-shaft, *E* the pitman, *F* the chilled crushing-plates, *G* the side plates, *H* the connecting link.

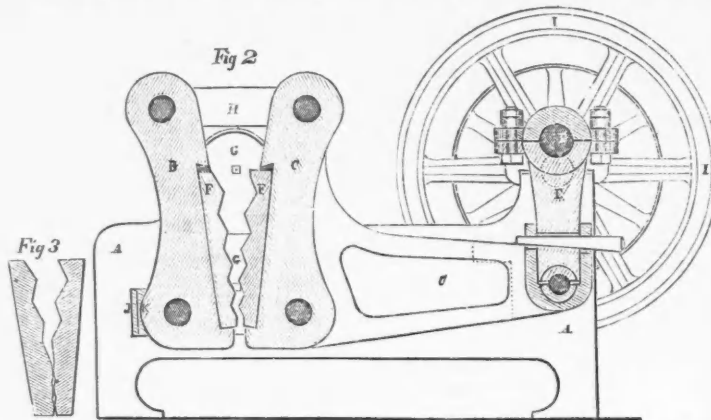
The jaws oscillate on fixed centers, running through the bottom of the jaws, and secured in the frame *A*. Motion is imparted to the large jaw *C* by the crank *D*, and communicated to the small jaw *B* by the links *H*. It will be noticed that the distance on the top and on the bottom of the jaws is fixed, and the crushing is done by the change of angle on the corrugations of the movable jaw-plates *F F*.

The bottom pin, which runs through the small jaw *B*, is secured in a block resting in a slot in the frame *A*. This block is shown at *K*. The block is moved either forward or backward, by means of a wedge *J*, and the machine is adjusted to crush finely or coarsely by moving the wedge either in or out.

The plates shown in Fig. 2 are used for coarse breaking. (The plates as now made have only three corrugations, instead of five, as shown in the cut.)

Fig. 3 shows the plates used for fine crushing or pulverizing. By the use of the straight line on the bottom of the plate, a perfect parallel motion is obtained. The top of the plates act as a breaker, and the bottom, by their sliding parallel motion, rub or pulverize the ore or quartz to any degree of fineness, and with astonishing rapidity.

The machine is also double-acting; that is to say, there is no portion of the revolution of the crank-shaft that does not produce a crushing movement in the jaws. The journals are all cast of a special mixture of chill-



ing irons, which possesses great hardness; and should they ever need renewing, it can be done without machine labor.

This machine is useful for breaking stone for roads and ore for blast-furnaces, limestone, etc., or for pulverizing iron or zinc ores. It is capable of breaking from any grade of coarseness down to the finest dust. Fine and coarse crushing plates are furnished with each machine. Owing to the manner in which it attacks the material to be crushed, it is said to take less power in proportion to the work done than crushers working on the principle of direct compression.

This machine is built at the Union Iron Works, Rockaway, N. J., and is strong, well-built, and not liable to get out of order.

The principle certainly possesses some novel features that would lead one to credit the claims made for its great efficiency; and as its practical operation can be examined, it is worthy the attention of those requiring such a machine.

It is well known that the resistance to compression in many minerals and rocks is about ten times their tensile strength; but the motion of the jaws in this machine is such that the rock is subjected to a kind of torsional strain as well as compression, and it will break under that in which its resistance is least.

A recent price-list gives the following as the cost of these crushers at Rockaway, N. J.: No. 2—a crusher of a receiving capacity 3 in. x 8 in., said to crush per hour, through a No. 12 mesh, 1500 lbs. of iron ore, or to a chestnut size 6000 lbs., making 225 revolutions per minute, with an expenditure of 3 horse-power, costs \$400. No. 8, which is the largest size, costs \$1500, has a receiving capacity of 10 in. x 20 in., crushes to the above sizes 4300 lbs. and 18,000 lbs. per hour, makes 110 revolutions, and requires 16 horse-power. There are intermediate sizes which are adapted to any desired use.

LEAD FUME, WITH A DESCRIPTION OF A NEW PROCESS OF FUME CONDENSING.*

By A. French.

(Concluded from page 50.)

The performance of a long flue is greatly improved by having series of wide settling chambers near, but not quite, at the far end. These prevent the agglutinated particles, or flakes, from being swept out into the air by the draught. A flue on this principle of about 1200 or 1500 yards, inclusive of about 200 yards of chambers, having a width of about two and a half times that of the flue, yields as good results as one 2 or 3 miles long. This is the principle on which the one at the London Lead Company's Works, at Nenthead, in Cumberland, is constructed. The deposition of lead fume may be seen on a small scale very well by aspirating smoke very slowly through a few feet of narrow tube, kept cool by water outside, and then through a long, wide glass tube, placed horizontally and terminating in a wide receiver. A white deposit will be formed along the bot-

tom of the wide tube and receiver, while the upper part, or that which represents the roof of the flue, remains perfectly clean and transparent. We soon learned by experience in our assays of the flue gases that the heavy fume tends to flow along the floor of the flue, even when the velocity is as much as 6 or 7 feet per second. This requires to be kept in view when taking samples for examination.

The second class of condensers—namely, filtering through brushwood, cokes, wire netting, tangled wire, or coarse woven fabric—has frequently been attempted, but never with satisfactory results. Such material, if kept dry, does not arrest much fume until nearly choked up, and then the draught ceases; and if kept wet, scarcely stops any at all.

Our experiments on filtering were chiefly made with wet cokes. In our first, we passed the smoke successively through two beds of coke, each 6 inches deep, placed one above the other. A dripping apparatus was attached to keep the cokes wet: the cokes were broken and sifted to the size of from pigeon's eggs to horse-beans. The flue gases were propelled through the filter by means of a rotary blower, with a pressure equal to 5 inches of water. This was allowed to run for four days. The smoke which was sent through the filter was drawn off from the main flue at a considerable distance from the furnaces, and contained, on an average, $\frac{1}{4}$ grain of metallic lead per cubic foot. When the filter was opened, the cokes were almost clean; the water in the bottom of the apparatus contained not more than 3 ounces of fume, and after washing the cokes, the total quantity did not amount to more than from one tenth to one twentieth of the quantity of fume which passed. We afterward tried the effect of a greater depth of coke. Two towers, 13 feet high and 12 inches wide, were filled with pieces of coke about the size of oranges, and the smoke was sent first up the one and then down the other. An intermittent supply of water was employed to keep the cokes open.

It required a tension of 12 inches water to draw the smoke through the towers. In order to determine accurately the results of our experiments, large samples of the smoke, before it entered and after it left the towers, were drawn through cylinders filled with cotton-wool, and then through a long glass tube inclined at an angle of about 20°, having a bend at the lower extremity like a cooper's tube, but open at both ends. This contained a little water, which served to wash the gases after passing through the wool. The gases were drawn through the two sets of apparatus by means of an aspirator worked by steam-jet, and their quantities measured by two large gas meters.

In the above experiments, the gases, before entering the coke-towers, yielded 545 grains metallic lead per 1000 cubic feet, and the gases escaping from the towers gave 356 grains, or 35 per cent caught. A second experiment was made, with a similar result, and as a good deal of power was required to draw the smoke through 26 feet of coke, this method was considered quite useless. It may be well to state that the question of recovering the volatilized silver was of great importance.

We next tried filtering through strong canvas cloth made up in a bag, exposing a surface of about 40 square feet, but this method did not succeed. The fume passed freely through the canvas at first; but after a short time, the meshes became completely closed, and the passage of the smoke became so impeded that the experiment had to be stopped. The bag was then washed, and about 3 ozs. of fume were obtained after a run of about an hour and a half.

The following experiment shows with what great freedom lead fume escapes through cloth filters. A glass cylinder, about 1½ inches in diameter, was fitted with four calico diaphragms of gradually increasing fineness, the coarser being placed first. After aspirating the smoke through them for an hour, they were removed, and each was found to have a perfect coating of fume on the side against the current. Their order was now reversed, the finest being placed first, and using fresh cloth. After running for another hour, we found the foremost and finest only had caught fume, and all the others were quite clean.

In other experiments we invariably found that smoke which which had passed through a calico filter of a given fineness did not form any deposit on a diaphragm of coarser stuff, but in every case there was an escape of fume through the cloth. This was shown by the darkening of sulphide of ammonium through which the filtered smoke was made to pass.

We now come to the third class of condenser, namely, the use of water either in the form of steam or on the shower-bath principle. One of the earliest attempts to catch lead fumes in this way was made at Allenheads, near Alston Moor. There they had a long flue extending nearly three miles up a hill. Along the first hundred yards two perforated pipes were carried on each side of the flue. Small lead or copper nipples supplied a profuse shower of water. This plan did not succeed well. The small jets got stopped up with bits of straw, grass, and other organic matters, the quantity of fume caught being no greater than it would have been in a dry flue. The plan was abandoned. The opinion is now very general among lead smelters that, the drier a flue is, the better it arrests the fumes.

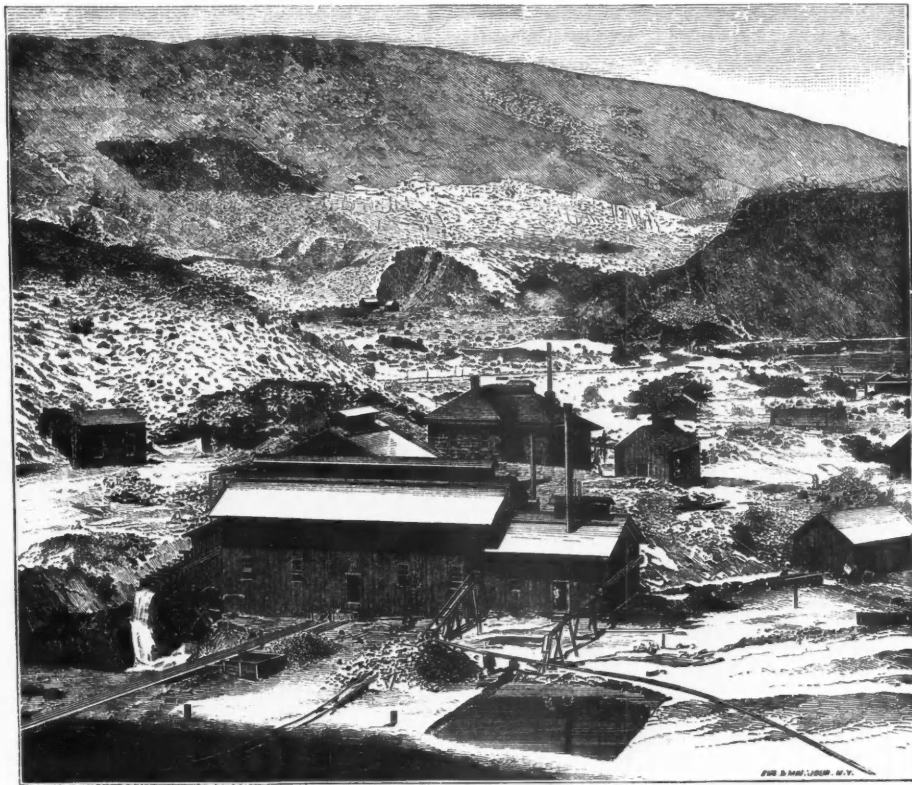
The shower-bath principle is now very extensively carried out at the Wanlockhead Lead-Works, belonging to the Duke of Buccleugh, in Dumfriesshire. About two tons of water are delivered per minute in fine jets over the smoke, while it is ascending and descending in a tortuous course through a series of tall chambers filled with earthenware drain-pipes. Very good results have been obtained from this condenser; that is to say, to obtain large quantities of fume, it was found expedient to extend the flue beyond its from time to time until it has now reached a distance of one mile beyond the condenser; and the fact is of considerable importance that about one half of the fume saved every year is obtained from the long flue, and the other half from the condenser.

Practical results accord well with the theory that rain-drops, with their comparatively enormous surface-tensions, are ill adapted to collect the extremely mobile particles of fume they encounter in their descent.

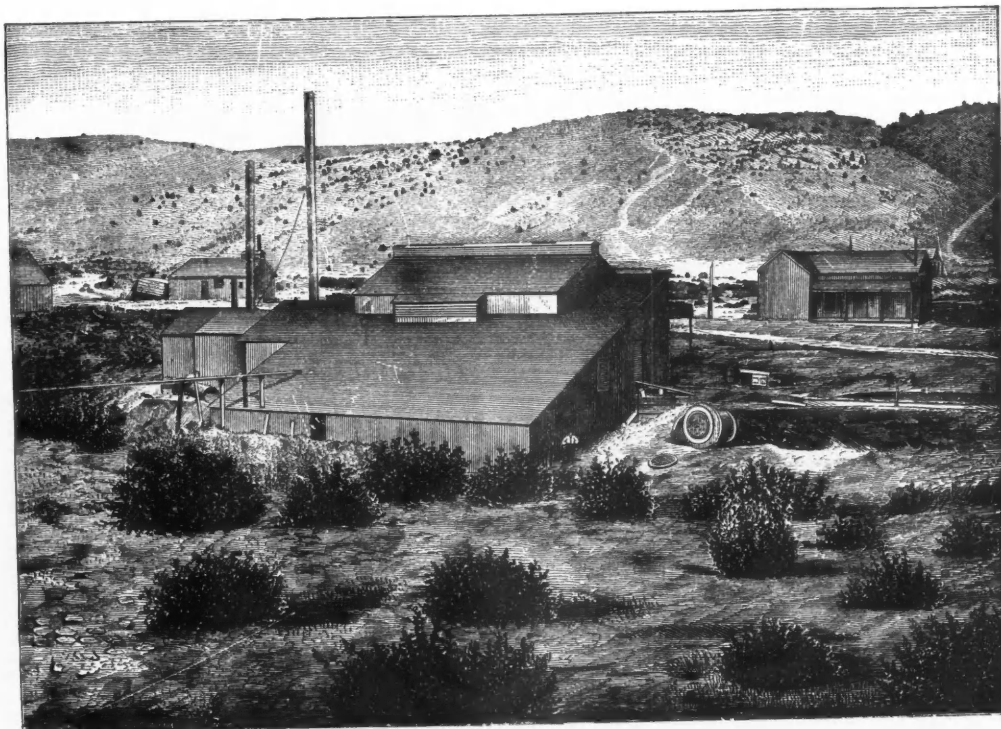
The use of steam in the flues as a condensing agent, although still carried on at some places, scarcely deserves notice, as it is positively injurious. Most flues contain an average of about 5 per cent of moisture; and as soon as this condenses into water, there is generally a notable decrease in the quantity of fume which subsides.

The fourth class of condensers consists of those which have for their

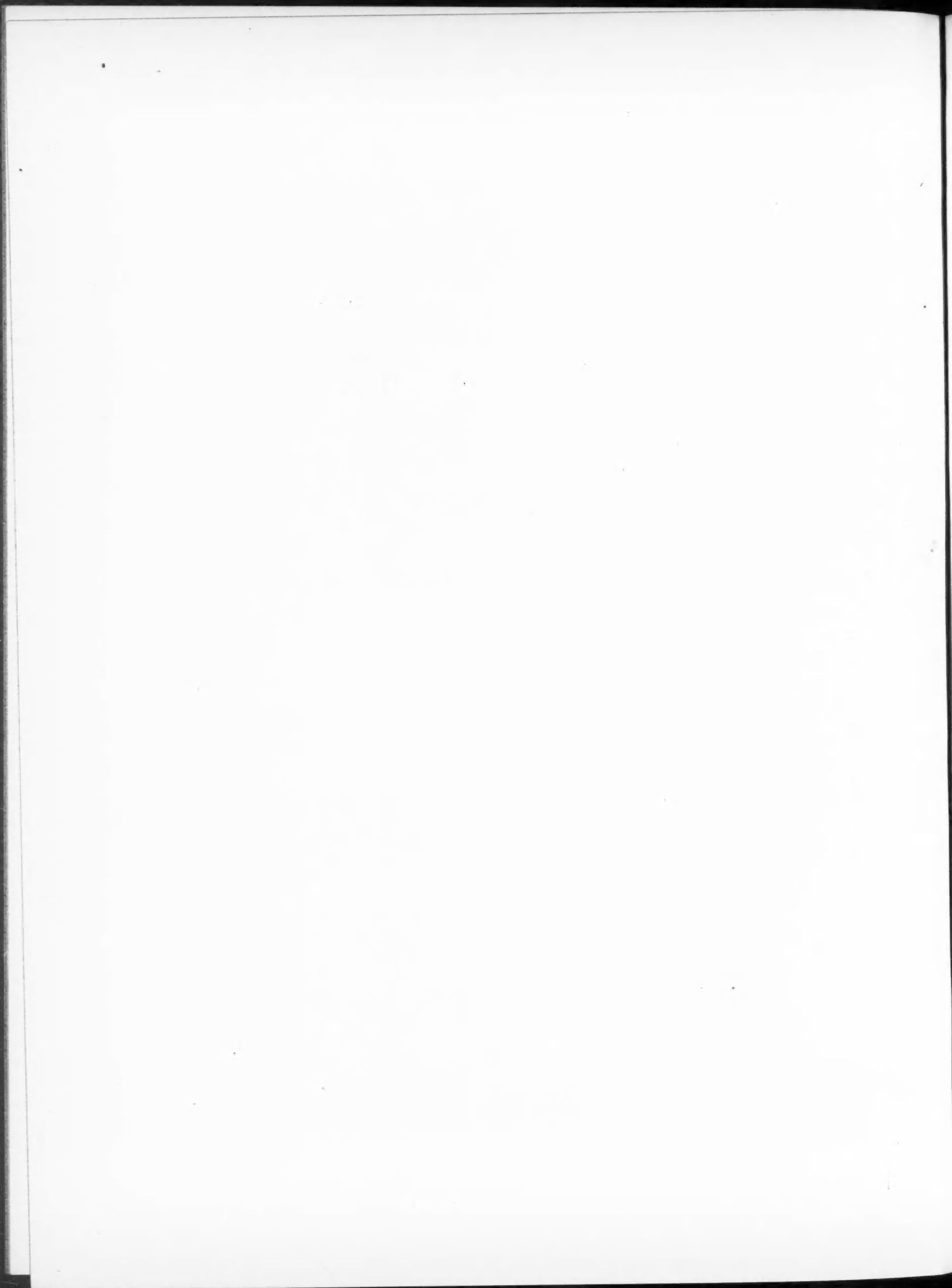
* Read before the British Association for the Advancement of Science (Section B), Sheffield, 1879. From the *Chemical News*.



STORMONT MILL.



BUCKEYE MILL.



principle the passing of the smoke through a body of water. This principle has been tried in various ways. The old Stagg's condenser, in which the smoke was drawn in great volumes under the surface of water by means of powerful pumping, is now nearly if not altogether obsolete.

Our experiments showed that mere bubbling the smoke through water from a perforated pipe, for example, has little effect in stopping the fume. We made experiments to prove this, both on the large and small scale. In the large one, we passed the smoke through a number of horizontal perforated pipes submerged 11 inches in water. Our assays showed that only 30 per cent of the fume was arrested. Our experiments on a smaller scale gave even worse results. The reason why simple bubbling through water succeeds no better than the shower-bath principle is, that in both cases precisely the same cause operates, namely, the surface-tension of the water, which is just the same, whether for a concave or convex surface of equal extent.

We can prove that fume is difficult to wet by coating a glass plate with it, and then dropping water on it while it is held at an angle of about 60° to the horizon; the drops are reflected off without wetting the plate.

This question of surface-tension was well illustrated by an experiment made at the suggestion and in the presence of Mr. Alfred E. Fletcher, one of Her Majesty's Inspectors. Equal quantities of smoke were bubbled through a wash-bottle arrangement, filled first with water, and then with ordinary rape oil. The oil, which has less than half the surface-tension of water, caught more than three times as much fume as the water.

The considerations led us to seek for some way of destroying the surface-tension of the bubbles, and we hit on the device of using fine wire gauze, made of any metal capable of resisting the corrosive action of sulphurous acid. Copper gauze answered perfectly.

In our new apparatus, we use wire gauze having about 15 meshes to a lineal inch, the meshes being about one twentieth of an inch wide. A number of gauze diaphragms are arranged one above the another in horizontal planes, and at small distances apart. The whole is submerged in water. The smoke is equally distributed under these by means of a horizontal series of perforated pipes. The gauze diaphragms do not add much to the resistance which the smoke current has to overcome in its passage through the apparatus; three diaphragms of the size mentioned above add about half an inch of water pressure. The depth of water usually employed is seven inches above the perforated pipes, and with this depth the water-gauge indicates a resistance of about 10 inches, half an inch only of which is due to the gauze, the remainder being due to the depth to which the smoke depresses the water at the inlet passages. The ascending gases set up an upward current of water through the gauzes, and, to promote a steady circulation of this, a return passage is provided.

Although we usually work with three diaphragms of wire gauze, double that number may be used without adding appreciably to the resistance, and by so doing still more perfect results may be obtained. Each square foot of area of the diaphragm space is capable of passing about 40 cubic feet of smoke per minute; and when a blast-furnace is employed for smelting lead ore, about one foot of area will be required for each ton of ore smelted in twenty-four hours.

During the past six months, almost daily assays have been made of the smoke before it entered and after it left the condenser. These have, with a few exceptions, exceeded 95 per cent of fume caught. The average has been 98 per cent, and, in a few cases, as high as 99½ per cent of the metallic contents of the smoke has been caught. After the lead has been removed from the smoke, the large quantity of sulphurous acid which is usually contained in it may be recovered in a very simple manner. The gases can be mixed with a little air, if enough of oxygen is not already present, and then propelled by means of a steam jet through a heating apparatus similar to the hot blast heaters used in iron smelting works, and the hot sulphurous acid steam and air passed through common salt, according to Hargreaves's patent process. By this means, lead or copper smoke will be rendered not more pernicious than that from ordinary chimneys. Any arsenic or zinc which reaches the condenser is dissolved in the water, and in that way separated from the lead fume, which subsides to the bottom. The apparatus was tried with hydro chloric acid vapor, and condensed 97¾ per cent; of common salt vapor, it condensed 93 per cent.

We use a Roots blower, with iron revolvers for forcing the smoke through the apparatus: from 2½ to 3 horse-power is amply sufficient to work a condenser large enough for a furnace to smelt 15 tons of lead ore per twenty-four hours. The weight of a condenser for that size of furnace is 18 cwts. The smoke should be cooled to about 120° to 130° Fahr., by passing it through iron pipes, or any other kind of flue. This is necessary to prevent rapid evaporation of the water with which the condenser is supplied. It is very important to cool the smoke, as far as possible, so as to have a smaller volume to pass, and thereby save both power and cost of a larger apparatus.

A DEEP ARTESIAN WELL.—The artesian well near Buda Pesth is now completed. The works were commenced in 1868. The total depth is 3200 feet; and the temperature of the water it yields is nearly 165° Fahr. The temperature of the mud brought up by the borers was taken every day, and was found to increase rapidly, in spite of the loss of heat during its ascent, down to a depth of 2300 feet to 2700 feet. Beyond this point, the increase was not so marked. At a depth of 3000 feet, the temperature was 177° Fahr., giving an average increase of 1 degree for every 23 feet bored. Water first commenced to well up at a depth of 3070 feet; here its temperature was 110° Fahr., and from this point onward it rapidly increased both in quantity and temperature. Thus, at 3092 feet, its temperature had already risen to 150° Fahr., and the yield in twenty-four hours from 9500 to 44,000 gallons. Finally, when the boring had reached 3200 feet, at which point it was stopped, the temperature of the water, as it burst from the orifice of the tube, was 165° Fahr., and the volumetric yield 272,000 gallons in the twenty-four hours. The yield was afterward reduced to 167,200, gallons in consequence of the bore being lined with wooden tubes which reduced its diameter. The water obtained disengages carbonic acid in abundance, and also contains nitrogen and a little sulphureted hydrogen, and 80 grains per gallon of fixed matters, chiefly sulphates and carbonates of potash, soda, lime, and magnesia.—*Engineer.*

PROGRESS IN SCIENCE AND THE ARTS.

Technology.

Electric Brevities.—Prof. Rosetti, of Padua, sends to the *Société Franç. de Phys.* an account of some measurements of the heat of the electric arc. With 80 Bunsen elements he finds for the negative carbon 2400° C. [4352° F.], for the positive pole 2870° [5198° F.], and for the arc, 3586° [6332° F.]. Not having the original paper at hand for reference, we can make no mention of the method by which those temperatures were measured.—According to the French Journal *Les Mondes*, the electric light has been exhibited with much éclat at Teheran, the capital of Persia.—The Western Union Telegraph Company is reported to be engaged in devising a plan for the extensive introduction of underground lines in this city. The planning of this work has been referred to Mr. Radcliffe, a telegraphic expert familiar with the operation of similar systems abroad, and it may be expected to see the attempt made, at an early date, to do away with the post system in the streets of the metropolis. The Brooks system, in which the W. U. Company is understood to be largely interested, will be the one adopted. A line of this kind is about to be put down, by the way, by the Western Union, between Newark and Trenton.—The Western Union Company has prepared a bill for presentation to Congress, which is intended to establish, by legal enactment, the absolute inviolability of telegraphic dispatches.—The network of subterranean telegraph lines in the German empire, has been called upon to stand the test of some remarkably unfavorable weather, and has made so good a record as to have established its superiority to the aerial system beyond question. A considerable extension of the underground system is now proposed.—The American Union Telegraph Company, the new rival of the great company that has so long enjoyed a monopoly of the telegraphic business of the country, is reported as about to be opened for general business. The new organization is affirmed to have powerful financial backing. It has succeeded in effecting an advantageous contract with the Pennsylvania, Baltimore & Ohio, and other railroad companies, by which it has been admitted to all the telegraphic privileges of these companies for a term of years; it has secured the control of the Central Union and Empire Telegraph companies' lines, a controlling interest in the Dominion Telegraph company, of Canada, which connection gives it the contract for an exchange of business with the Direct U. S. Cable Company; and it has secured, besides, a contract for the exclusive exchange of business for twenty years with the recently-completed French Atlantic Cable. The "American Union" now owns 12,000 miles of wire in the United States, and controls nearly twice as much more.—There are no new developments concerning the Edison light since our last comments thereon.

Metallurgical Notes.

Wolfram Bronzes are furnished by Biermann, of Hanover, which contain, after Strohmeier's analyses, 95.39 per cent of copper, 3.04 per cent of tin, and 1.57 per cent of wolfram. The alloy is represented to be very tough, malleable, ductile, and to possess great tensile strength. The addition of from 1.5 to 2 per cent of wolfram has the effect of increasing the hardness of the metal four or five fold, without affecting its toughness unfavorably. The bronze requires a slightly higher temperature for working than ordinary brass, and must be cast in very dry sand, or in iron molds. For the above facts we refer to the authority of the *Berg-u. Hüttenmänn. Ztg.*—The world's production of Bessemer steel has enormously advanced since 1870. Since that year, the production of the United States has increased from 40,000 to 550,000 tons, and that of Great Britain from 250,000 to 750,000 tons. Germany and France now have a yearly production of 250,000 tons each, while that of the rest of Europe, not here included, would swell the foregoing figures by about 200,000 tons more.—Boisbaudran has lately described, before the French Academy, several alloys that he has succeeded in forming of gallium with aluminium. The behavior of some of these compounds is singular, though they have no technical importance.—*Electro-metallurgy* has been applied to the making of statues, the method having been successfully inaugurated by the reproduction of a large clay model in bronze by the electrotyping process, instead of the usual one of casting. This statement is warranted by the announcement that the Electro-Metallurgical Company of Brussels has just completed a colossal statue in bronze of Jan Van Eyck, the great painter, by the system of galvanic deposition.—The American Manufacturer evidently anticipates a lively year for the iron business. It says, in its latest, that accounts are coming in from almost every direction of blast-furnaces blowing in, and of others that are being put in readiness to go in blast as rapidly as possible, while statements of new ones being erected are not rare. An unprecedented quantity of iron, it is stated, will be made in the United States this year.

Miscellaneous.

U. S. Geological Survey of the Territories.—We learn that the forthcoming reports of the field-work of the Hayden Survey, for the years 1877 and 1878, will be illustrated with three topographical atlas sheets, of the same size and on the same scale (four miles to an inch) as the magnificent Colorado atlas. These sheets refer to portions of Wyoming, Idaho, and Utah. Each covers 2½ degrees of longitude and 1¼ degrees of latitude, and includes an area of about 11,000 square miles. The *American Naturalist*, from whose columns we glean the above facts, gives a detailed account of the admirable system of executing this and other geographical work performed by the survey, and concludes with the remark that "the maps of this survey have been justly regarded as among the finest specimens of cartography ever published in this or any other country."

Another Antiseptic.—The benzoate of soda is recommended as the best antiseptic for all infectious diseases, on the authority of Prof. Klebs of Prague. The author's experiments show that it acts very powerfully, and he affirms that a dose of from 30 to 50 grams to a full-grown man, given daily, will render the poison of diphtheria inoperative. He prepares the benzoate by dissolving crystallized benzoic acid in water, neutralizing at a gentle heat with caustic soda, and then crystallizing the solution over sulphuric acid within a bell glass.

GENERAL MINING NEWS.

Gold mines have been discovered in Eastern Siberia. The quicksilver mines of Santa Clara (Cal.) produced 32,240 flasks last year. Over 25,000,000 pounds of freight were received in the Black Hills in 1879. All the Rabbit Hole (Nevada) sulphur mines are now consolidated and owned by one company. They have let a contract to haul 15,000 tons of brimstone from the mines to the railroad, and are now making shipments regularly. They expect to be able shortly to deliver from 10 to 12 tons of sulphur daily at the railroad, and will be able to deliver it cheaper in San Francisco than it can be imported. Their intention is to supply the whole Pacific coast with the article, as there is an unlimited supply of it at the mines. "Timber-line," the highest point at which timber grows in the Rocky Mountains of Colorado, is from 11,000 to 12,000 feet above the sea. Snow-slides are of frequent occurrence in the San Juan country.

ARIZONA.

THE HERMOSA MINE.—Mr. E. T. Cox, State Geologist of Indiana, writes of this mine as follows in the *Arizona Weekly Star* of January 1st:

"In visiting the various openings on this property, one is struck with the large piles of rich ore and the small amount of waste material that lie around the works. There are a number of mines belonging to the Harshaw Mining Company, but I only had time to visit this one. The Hermosa claim embraces three veins called 'Front,' 'Middle,' and 'Back' veins. "The various veins show an average width of over 15 feet over the ground prospected, which includes 629 feet. Shaft No. 3 is 72-6 feet deep; No. 4, 40 feet deep; and No. 5 is 66 feet deep. These cuts and shafts all show a solid body of ore; and if we estimate from them the amount of ore practically in sight, we are astonished to find that it amounts to 43,546 tons. The average value of this ore, derived from a multitude of assays and by the sampling of various experts, is \$135 to the ton of 2000 lbs.

"In the middle vein, the chute is 200 x 15 feet wide, and the assay value is, on the same authority, \$60 per ton. "The ore-chute on the back vein is 307 x 4-6 feet, and the average value is \$139 per ton. The average depth of working on this vein is ten feet.

"Commencing in the ravines on either side of the mountain, at a depth of 250 feet, a tunnel is being driven through, which will cut all the lodes, and be 750 feet long when finished. This tunnel is being laid with railroad track, and the ore will be discharged from one side into wagons which move over a good road to the mill site, a quarter of a mile distant. The waste material will be discharged from the other end of the tunnel into a deep gorge. Indeed, the whole work goes to show able management and well-devised plans for cheap mining and delivery of the ore to the mill.

"I also visited what is known as the Hardshell property, which embraces a number of mines also situated on Hermosa hill or mountain. The Hardshell and the Hardshell extension have as yet had but very little work done on them; but that little goes to show that they carry large bodies of rich ore and of a similar character to that found in the Hermosa.

"These mines are situated in the midst of an abundance of wood and water, and possess every facility for being cheaply worked."

SUNSET MINE.—The weekly *Nugget* of January 8th says: "A party of gentlemen from Pennsylvania have purchased this mine, paying \$60,000 for the same, and have commenced work upon it. They are going down on shaft No. 1, also the New Discovery shaft; and in the latter, after sinking about three feet through a limestone capping, came upon a ledge, eight feet in width, of excellent ore. In the old shaft, after taking off the capping, they came upon a ledge which is widening as the work progresses. There are three distinct mineral ledges on the claim, and it is the intention to erect a mill, if the developments will warrant it."

COPPER.—The *Arizona Miner* of January 9th says: "To the north of Prescott, in the Black Hills, there exists a section of country that contains some wonderful copper ledges. They are mammoth in dimensions, and carry on the surface, before the richest ore is reached, ore that assays from 33 to 50 per cent in metallic copper. One mine assays, from average ore, 47½ per cent; while another reaches nearly 60 per cent, with a fair quality of silver. Railroad communication heretofore has been remote and transportation high, rendering it almost impossible to handle any mining property. However, since a remedy is coming to us, these properties are stepping to the front, and we hope soon to chronicle the sale of two or three copper mines in the near vicinity of Prescott."

From the *Silver Belt* of January 10th we condense as follows: "The Stonewall Jackson is turning out large quantities of very rich ore. The great difficulty under which the company labors is a want of sufficient water for milling purposes; but that can and will be obviated."

"The amount of bullion extracted by the Stonewall Mill and Mining Company during the month of December, 1879, was \$15,099.98. The difference in this amount and that published last week will swell the total amount of bullion shipped in the month of December from here to \$32,596.92. Had the mills been at work all the time, double this amount would have been obtained."

"J. S. Mansfield has bonded 60,000 shares of the Silver King mine for \$1,200,000. This is the interest held and controlled by J. M. Barney, and, as there are only 100,000 shares, will give Mr. Mansfield the controlling interest in the mine and mill property. The mine is situated in Pinal County, and, as several parties were after this prize, we are glad that one of our own citizens has carried it off. Twelve hundred thousand dollars for such a mine is certainly a low figure for that interest. The King is unquestionably one of the most noted mines of this continent, and for quantity and quality of ore, it is second to none."

CALIFORNIA.

A large deposit of asbestos is stated to have been discovered in the western part of Colusa County. It is of the gray variety, and has a good fiber.

BODIE.

The *Free Press* of January 20th says:

"A vast amount of dead-work is now about completed in the Bodie mines. As long ago as last fall, and even earlier, water had been struck in nearly half the mines on the lead at a general depth from the surface of from 350 to 400 feet. This necessitated pumping-machinery, and a larger outlay of money than the Bodie stockholders had ever been called upon to meet. This tax, however, was nobly met, and now the following companies have pumping-machinery, either working or in a nearly completed condition: Standard-Bulwer (jointly), Bodie, Mono, Jupiter, Champion, South Bulwer, South Bodie, South Standard, Dudley, Goodshaw, Noonday, and Booker. Nearly all these mines have just recommenced work under the new order of things, and we shall shortly be advised of what is below the water-level."

A REVIEW OF THE BODIE MINING DISTRICT.—The *San Francisco Commercial Herald* of January 15th says:

"G. J. Griffith, Superintendent of the Wales Consolidated mine, Eureka, who has been taking a look at Bodie Mining District, gives the following:

"Bodie contains about 6000 inhabitants, who support 156 drinking places, several newspapers, and many attorneys-at-law, without a single church. Prior to January, 1876, but 18 claims were recorded in the district. From that date until January, 1878, 206 were made, and the bullion yield amounted to \$797,022. During the year 1878, \$2,100,409 were extracted, and 360 claims were recorded. In 1879, 374 additional claims have been made, and the yield is \$2,488,464, making in all 958 recorded locations, very few of which have begun to yield, and the gross bullion yield since 1872, \$6,385,886. There are already erected, exclusive of whims (horse-power), 24 steam hoisting-works on the follow-

ing mines: Standard, Bodie, Mono, Bechtel, Black Hawk, Tioga, Summit, McClin-ton, Consolidated Pacific, Butler, South Bulwer, South Standard, South Bodie, Goodshaw, Addenda, Oro, Noonday, Maryland Consolidated, University, Queen Bee, Jupiter, Champion, Spaulding, and Booker. There are erected and in process of erection seven quartz mills, containing 125 stamps, as follows: Standard, 20 stamps; Syndicate, 20; Bodie, 10; Miner's, 5; Bulwer and Standard, 30; Noonday, 30; Spaulding, 10. Although several applications are made, yet the Standard, Syndicate, and Spaulding are the only mines covered by United States patents. The depth attained (500 feet) and permanency of the ore-channels fully warrant the assertion that the bullion yield will be nearly doubled in 1880. The future of the camp is certainly full of promise."

COPPER.—The increase in value of copper ingots now being over 40 per cent, is turning attention to the production of that metal. A California paper, in urging the establishment of mills, says: "Prominent among the copper mines of this coast are the San Francisco Copper Company's mine, the Battle Mountain mine, the Newton Copper mine, the Eagle Copper mine, and several others. The San Francisco can produce about sixty tons per month of precipitated copper; the others could probably be wrought up to a similar quantity, if not to greater amount. Besides those named, there are many mines that would be worked to advantage if there was a home market for the copper or for the ore."

COLORADO.

ARGO, the site of Senator Hill's smelting works, has been incorporated as a town.

CLEAR CREEK COUNTY.

The Georgetown *Miner* states that the stamps, amalgamation-barrels, etc., are being removed from the old Pelican mill preparatory to its being thoroughly fitted up as a crushing and sampling mill for the Boston & Colorado Smelting Company.

The **FREELAND** mine is producing 75 tons of ore per day. The cost of concentration is 75 cents per ton.

The **BAXTER** mine shows continued improvement. There are over two feet of ore in the lower levels, 130 feet below the level of the Diamond tunnel. A large number of leasers are steadily employed, a majority of whom are doing well.

CUSTER COUNTY.

A new level at one hundred and thirty feet is being opened on the **BASSICK** mine, from which fifty tons of ore per day are taken, sixteen of which are daily shipped to the sampling works at Silver Cliff. One hundred men are at work in the mine. The ore is stated to be nearly solid in the bottom of the shaft, with the prospect of its being entirely so in a short time.

The **SILVER HORN** mine is said to be turning out some very rich ore. "The **BULL-DOMINGO** mine," the *Silver Cliff Miner* says, "is working 90 men, who are taking out 40 tons of 100-ounce ore per day; \$3000 per month are spent for timbering and incidentals, and \$6750 for wages. The stock of the mine is not on the market."

LAKE COUNTY.

"The **CHRYSOLITE**," the *Leadville Democrat* says, "has been increasing its ore output, the amount now averaging 150 tons daily. For the month ending January 15th, \$200,000 were sent from the mine to the main office in New York, and during the same time \$65,000 were spent in Leadville for labor, improvements, and material."

The **PENDERY, GLASS,** and **ROUGH AND READY** mines have been united under one management, to be known as the Glass-Pendery Consolidated Mining Company. The capital stock is placed at \$5,000,000, divided into 250,000 shares at \$20 each.

The **ANNIE** Mining Company has four shafts, all connected by underground workings. The present daily production is 40 tons of very high-grade ore. The production for the month of January is estimated at \$200,000.

PARK COUNTY.

The *Fairplay Flume* says: "There is already more snow on the ranges and peaks than there was during the entire winter of 1878-9; and consequently, placer mining may be made much more profitable in the season of 1880 than last year. A movement is under way to consolidate the principal placer claims in a larger corporation. In such event, operations will be conducted on a scale of magnitude similar to the California system."

SAN JUAN.

The *La Plata Miner* says the Bonanza tunnel is in about 1100 feet. Considerable mining work is being done in the Summit Mining District; no mills in operation at present.

Three hundred and thirty feet, it is stated, have been gained on the Saxon tunnel at Poughkeepsie Gulch, until it is now 50 feet beyond the lake shaft, and almost under the Saxon Lake. The vein was cross-cut under the shaft, and about five feet of paying mineral uncovered.

Colorado's gold belt is now probably yielding more than any area of similar dimensions in the world. It extends from the northern part of Boulder County, southerly through the little county of Gilpin and the northeastern part of Clear Creek County, a distance of 30 to 35 miles, with a width of several miles. The present monthly output of Gilpin County is nearly or quite \$350,000.

DAKOTA.

Dakota is the largest of the organized territories, containing about 150,000 square miles. Population about 160,000.

The product of the Black Hills mines is estimated at \$3,000,000 for the past year.

The *Black Hills Herald* says: "The Deadwood Mining Company has a net surplus of over \$200,000. The average monthly yield for the last eight months was \$37,817.93; average monthly expenses, \$10,236.32, leaving a balance of \$27,581.61. An additional mill for the company will soon be put up."

The *Black Hills* are dropping more stamps than the Comstock.

An exchange says:

"The largest specimens of nugget gold ever found in the Black Hills were got in Potato Gulch. Upward of \$50,000 have been exhumed from the gravel of that narrow ravine, one nugget of which brought \$128. Nearly all of the gold was exceedingly coarse, varying in size from that of a hazel-nut to that of an egg. Many lumps were found imbedded in quartz, thus showing that it had been washed out of a decomposed quartz vein not far from where it was found."

"Every one in that mining district is busy at work sinking on his claims to develop the hidden treasures."

MAINE.

THE MILTON MINING COMPANY.—The *Ellsworth American* of January 23d says:

"A new steam drill has been put in at this mine and worked admirably, sinking a hole in solid granite thirteen inches in three minutes. A new lantern has been lighted in the cupola of the Milton hoisting-works, which, being some eighty feet above the sea, is visible at considerable distance, and may be useful to the mariner. The Millbrook has enlarged its building, and will soon be ready for business. Our correspondent, writing under date of the 29th inst., says of the Milton: Shaft No. 1 is down 80 feet. Shaft No. 2—new hoister arrived and in place; galleys frame built, and every thing in good working order. Depth of shaft, 110 feet. Both engines in full blast and working nicely. Shaft No. 1, galleys frame raised and now hoisting from shaft; timbering in Shaft No. 1. Shaft No. 2 working two full shifts. Rock in bottom improving in quality; can not tell it apart from the best Sullivan ore; it carries galena and stephanite, and

looks very promising. The quartzite is all turning into good quartz. In the Waukeag, have broken through the hard rock into a stratum much more favorable for drilling and blasting; depth of shaft, 109 feet."

MICHIGAN.

THE LAKE SUPERIOR COPPER DISTRICT.

The Quincy copper mine has declared over \$2,250,000 in dividends during the twenty years it has been worked. Assessments during same time, only \$200,000. The stamp-rock will average about 2½ per cent of dressed copper. The mine is about 2000 feet deep; present output, 280 tons per day. The stamp-mill, about a quarter of a mile below the shafts, has 64 heads of the Wayne pattern cam-stamp, each head weighing 1100 pounds; 4 heads to a battery. The Sherman washer and Evans slime-table are used for concentrating the copper, and the monthly output is about 150 tons of metal. About 400 miners, mill hands, etc., are employed.

The Houghton (Lake Superior) Mining Gazette says: "The last days of 1879 find the prominent producing copper mines of this district—the Calumet & Hecla, Osceola, Franklin, Quincy, Pewabic, and Atlantic—in a condition to commend them highly to their owners, and place them in the front rank of legitimate mining enterprises. All will commence the new year under far more favorable auspices than they entered upon the one that is now nearing its close. The standard of economy in every department of our mines has been gradually rising from year to year, until now we can safely invite comparison, so far as the cost of breaking and handling rock and its subsequent treatment is concerned, with that of any other mining region in the country. Nor has all been accomplished in this direction that will be, so that the outlook for our industries was never better than it is to-day. The character of their shares, as a source of safe investment, is on a par with the best securities in the United States."

The scarcity of coal is compelling some of the mining companies to burn wood. The latter is selling at Ishpeming for \$5 per cord.

MONTANA.

The Helena Independent says: "The Gloster mine, near Belmont, is proving itself one of the rich mines of the Silver Creek District. A five-stamp mill has been recently erected on the mine, and the first run of eighty tons of unselected ore resulted in a clean-up of 130 ounces of gold. The vein is seven feet wide."

"ALICE MINE.—Professors Blake and Clayton have finished an examination of the Alice mine. It is understood that their report will be highly favorable. One hundred and fifty-one men are now on the pay-roll of the company. On the last pay-day, \$15,000 were disbursed for wages."

NEVADA.

Two steel wire cables, each to be 3700 feet in length, are being manufactured in England for the Yellow Jacket shaft. These will be the longest cables ever brought to the Comstock.

TREASURE HILL DISTRICT.

A strike is reported in the Eberhardt and Aurora tunnels in Treasure Hill, White Pine District. The tunnel is 2500 feet long, and has been run at a large expense. It is the property of an English company, which acquired by purchase the once famous mines above named. Probably the richest silver deposits ever found in the world were those upon the surface of Treasure Hill, but although many millions were taken out in a short time, the pay-ore was finally exhausted. The stock is said to have gone up \$25 per share, in London, on receipt of the recent news.

We condense from the Gold Hill News of January 21st, as under
COMSTOCK LODGE.—The Yellow Jacket shaft has now attained a vertical depth of 2800 feet. Notwithstanding this immense depth, the air in the lowest levels leading from it is so cool that some of the miners work with their coats on. In the Belcher, at a depth of 3000 feet, the men work with greater comfort than they did on the upper levels. The "problem of ventilation," which was at one time supposed to be the most serious obstacle to deep mining on the Comstock, has been satisfactorily solved. All that is needed to take a supply of air to any depth, is proper connection. Where two shafts are connected by a drift at the bottom, the air rushes down one and up the other. The deeper the shafts, the stronger the current of air.

UNION CONSOLIDATED.—"The east drift on the 2400-foot level continues in low-grade ore. A drift has been started north, which is opening up some excellent rock. On the 2300 level, stopes are being opened south from those on the 2200 level of the Sierra Nevada incline. The ore in this part of the mine extends nearly to the Union shaft, and is of fine quality."

OPHIR.—"Drifts are being run both north and south on the Hardy vein at the 2200 level. The drift north is in ore of a good milling quality."

BELCHER.—"The east drift on the 3000 level has been pushed up to the casing of the ore-vein and there left for the present for fear that water might be encountered by penetrating that casing, and the mine is now handling all the water it conveniently can. When relieved of a portion of that now sent to the pumps, this drift will be continued. The south drift on this level is being driven ahead with all energy, in order to reach a point under the cross-cut on the 2760 level, so as to work east and test the vein under the ore-streak encountered above. On the 2760 level, the drift north from the cross-cut east along the ore-vein is being pushed ahead, and occasionally the blasts throw out bunches of rich ore."

CONSOLIDATED VIRGINIA.—"Preparations are being made for running a drift south on the 2350 level from the C. & C. shaft to connect with the joint Best & Belcher winze to be continued on down from the 2150 level. A cross-cut east from the foot of this winze, and on the 2150 level, has been started. On the 1750 and 1550 levels, the stopes continue their accustomed yields. On the 850 level, work will soon be resumed in cross-cut No. 2, where water was encountered last November."

SUTRO TUNNEL.—"The north header of the tunnel is making unprecedented progress through Best & Belcher ground, penetrating dry rock which needs no timbering. The south header is in Bullion ground, and is also making excellent progress."

At the annual meeting of the Sierra Nevada Company on January 21st, Mr. Skae retired from the presidency, and the property passed into the control of the Bonanza firm. We condense from Superintendent McKenzie's annual report: "During the past year, the mine yielded 4082 tons of ore. Of this, 3143 tons have been milled, yielding \$199,154.08. The ore milled was extracted from the 2200 level. The water handled from the mine for the past ten months has amounted to 66,000,000 gallons, being an average of 220,000 gallons per twenty-four hours. In addition to the ore, 19,918 tons of waste rock have been raised from the mine during the past year, and drifts and cross-cuts run to the extent of 3008 feet. A large air-compressor has been erected, at a cost of \$50,000, one pair of powerful engines for underground work, with all appendages for hoisting, two large blower engines, and ten large and powerful steam-pumps; 6100 feet of T rail have been placed in the mine, together with two new incline giraffes; 22 ore-cars; a very large amount of piping, etc. The company has also purchased the Eureka mill, which has sixty stamps, and crushing capacity of 250 tons in twenty-four hours."

The San Francisco Stock Report says: "Unless times improve on the Comstock, there will be an exodus from that section next spring to some of the newer mining districts. There is a surplus of population now on the Comstock, and a loss of it would not interfere with the prosperity of the region. Next spring, there will be some inviting fields for the prospector and the seeker for new mining camps. Colorado, a large portion of which is a mining terra incognita, will be scoured by prospectors in search of mineral wealth, and dozens of new camps will spring up in its borders."

Nevada mines produced and treated during the fiscal year of 1878-79, ending June 30th, ore to the amount of 691,010 tons, that was worth \$19,305,474. For the fiscal year 1877-78, the product was 940,982 tons, worth \$47,676,864, or \$28,037,139 more last year than this. The difference is due to the decreased product of the Storey County (Comstock) mines, as follows: 1877-78, 592,100 tons, worth \$35,778,348; and in 1878-79, 241,335 tons, worth \$8,824,962, a falling off in one year in one county of \$26,953,386; and, according to Wells, Fargo & Co., the entire State product for 1879 was \$21,997,714, which is a decrease of \$13,194,235 from the year before.

NEW MEXICO.

We quote from the Grant County Herald: "Coal has been discovered in the vicinity of Albuquerque. The ORTIZ mine, at the Cerrillos, has been sold to Senator Jones, of Nevada. Price not stated."

"LONE MOUNTAIN DISTRICT.—Of the mines now being worked in this district, five are regarded as taking the lead. Of these, the Campbell No. 1 shows a breast of ore about thirty feet in width, and running under the mountain, with a dip of about 25 degrees. Work has been pushed on this incline to a depth of some thirty feet, and every foot of development has shown improving quality of ore. That which is now being taken out mills from 100 to 300 ounces to the ton. The mine is regarded as, beyond doubt, the finest thing in the camp."

"The Home Ticket and Two Jacks also show splendid ore and in large quantities. A batch of three tons, taken from these mines, and recently worked in the Lone Mountain Mill, returned over 500 ounces to the ton."

"Campbell No. 2 shows an immense body of ore, and the owners are pushing work vigorously, taking out about four tons per day."

Mica mines are being worked in Rio, Ariba County. The population of the territory is estimated at 125,250.

THE ORTIZ LAND GRANT.

An Associated Press dispatch states that on January 22d Senator J. B. Chaffee and S. B. Elkins completed the purchase of the Ortiz mining grant near Santa Fé, containing sixty-nine thousand acres on the line of Atchison, Topeka & Santa Fé Railway. The litigation concerning the rich mineral deposits of this property which have been going on for years is now ended by the issue of a U. S. patent confirming the old Mexican grant. The price was over half a million dollars. Messrs. Chaffee and Elkins have already under contemplation plans for the development of the property, including a canal forty miles in length, from the Rio Pecos to the placer deposits.

The copper mines of New Mexico are attracting increased attention. One of the richest deposits is at Clifton, about 93 miles west of Silver City. At Santa Rita, near Silver City, are extensive mines. There are a number of other localities rich in the metal.

Carbonates in large quantities are reported to have been discovered on the Steene Peak Mountains.

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 week ending January 20th, 1880:

No. of Patent.	Title of Invention.	Name of Inventor.	Residence.
223,631	Pump.	Horace R. Baker	Fiskeville, R. I.
223,632	Steam-Engine Reversing Gear.	William Baxter	Newark, N. J.
223,635	Furnace for Steam-Boilers.	Hiram Cowell	Zanesville, O.
223,639	Anti-Friction Journal-Box.	Ellis D. Draper	Noorwood, Mass.
223,646	Regulator for Electric Lamps.	Edwin J. Houston	Philadelphia, Pa.
223,648	Apparatus for Separating from Compressed Air the Water of Condensation.	Simon B. Hunt	New York City.
223,649	Pneumatic Apparatus for Economizing Compressed Air.	"	"
223,651	Triturating-Mill.	J. Henry Mitchell	Philadelphia, Pa.
223,657	Machine for Polishing Wire.	Stephen P. M. Tasker	"
223,658	Armature and Commutator for Magnetic Electric Machines.	Elihu Thomson	"
223,663	Pumping-Engine.	Norman W. Wheeler	Brooklyn, N. Y.
223,680	Boiler-Furnace.	Lyman B. Parks (a)	St. Louis, Mo.
223,684	Rotary Pump.	John M. Taylor (b)	Hartford, Conn.
223,688	Rotary Engine.	James A. Adams (c)	Lampasas, Tex.
223,693	Slide-Valve for Steam Engines.	George W. Anderson (d)	Elizabethton, Ind.
223,697	Stone-Crusher.	Theodore A. Blake	New Haven, Conn.
223,707	Hydraulic Motor.	William F. Class	Cleveland, O.
223,718	Voltairic Transmitting-Telephone.	Asahel K. Eaton	Brooklyn, N. Y.
223,735	Manufacture of Artificial Stone or Marble.	William H. Hoopes	Baltimore, Md.
223,738	Process of Tempering Steel.	Joseph C. Jenkins (e)	Humboldt, Tenn.
223,767	Gunpowder Punching-Machine.	Thomas Shaw	Philadelphia, Pa.
223,771	Grinding and Polishing Implement.	Tucker B. Stone	St. Louis, Mo.
223,790	Electric Lamp.	Francis Winters, Jr.	New York City.

RE-ISSUES.

9,048	Feeder for Quartz-Mills	Thomas A. Cochrane	San Francisco, Cal.
9,052	Portable and Road Engine	Benhard Yoch (b)	West Belleville, Ill.
9,053	Method of and Apparatus for Pulverizing and Separating Metalliferous Quartz, etc.	Samuel F. Hodge	Detroit, Mich.

- (a) Assignor to Thomas K. Kelly, same place.
- (b) Assignor to himself and William Taylor, same place.
- (c) Assignor to himself and Isaac N. Haman, same place.
- (d) Assignor to Koert D. Hawley and Leman C. Anderson, same place.
- (e) Assignor of one half of his right to David T. Tripp, Waterloo, Ill.

RE-ISSUES.

- (a) Assignor, by mesne assignments, to Joshua Hendy.
- (b) Assignor, by mesne assignments, to Charles Cooper, George Rogers, Frank L. Fairchild, and Charles G. Cooper.

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:

For Rolled Iron Beams; Thomas Lincoln Casey, Lt.-Col. Corps of Engineers, Washington, D. C.	Feb. 2, 1880
Furnishing Dredge, Tug, and Dump-Scows; G. Weitzel, U. S. E. Office, No. 26 Washington avenue, Detroit, Mich.	" 2, "
Furnishing Iron Bolts, Spikes, and Plates, for Crib Work; G. Weitzel, U. S. E. Office, No. 26 Washington avenue, Detroit, Mich.	" 2, "
Building a Steam Propeller; John Sherman, Secretary of the Treasury, Washington, D. C.	" 5, "
Railroad Cars, for the Nicaragua Government; A. J. Cothel, Consul General of Nicaragua, 62 W. Thirty-sixth street, New York City	" 5, "
Pumping-Engine; H. H. Forsyth, City Clerk, Peoria, Ill.	" 18, "
Alterations and Additions to State House; C. E. Kemble and A. Peebles, Joint Architects, Charlestown, Kanawha Co., W. Va.	March 1, "
Tenders for Construction of a Railway in the Island of Ceylon, 41½ miles; tenders, sealed and indorsed, "Tender for Nanu-oya RR.;" Penrose G. Julian, Crown Agent for the Colonies, Downing street, London, Eng.	" 3, "

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, Jan. 30.

Although there are no striking features to the mining stock market, yet there is a very large amount of attention being given to mining investments. There are a large quantity of the better class of stocks being absorbed by the public for investment, and this removes the chance for speculation so long as the mines continue to produce regularly, no large bonanzas are struck, or the management does not attempt some trick to drive stockholders, through fear, into the market to make sales.

There are a great many wild-cats on the market, and some of them are being nursed by highly respectable gentlemen, probably from the fact that the claws have been well covered up. There are men who think they are such good judges of business and human nature that they can trust to the statements of interested parties and arrive at a thorough knowledge of a mining property, thereby saving the cost of an expert's fee. As a rule, this class loses many times the amount it tries to save. If any investor will wait until he can get satisfactory evidence of the value of a mine, or the character of the promoters, he will but very seldom lose a bargain, while in following any other course he will most likely make a bad venture.

The Comstock mines still have a hold in this market, but it is not so strong as last year, and appears to be weakening. Economical management and good behavior are spoken of in connection with these mines. It is hard to say what effect it would have on this market. It could not last, and soon there would be a resumption of the practices of the past for fleecing the public. California records sales of 2175 shares at \$3.90@4.10. Consolidated Virginia has been more active and higher, the sales amounting to 4605 shares at \$3.95@4.25. Sierra Nevada records 220 shares at \$22@23 assessment unpaid, and \$27@26, assessment paid. Consolidated Imperial has been only moderately active and inclined to weakness. The sales aggregate 7400 shares at 85@75c. On Monday, 50 shares of Julia sold at \$2½. In Leviathan there have been dealings amounting to 2500 shares at 40@26c. Union Consolidated had a sale of 10 shares on Saturday at \$45.

The Bodie stocks have been quiet, and a little under a cloud. Bodie records 645 shares sold at \$9@8. Standard has sold at \$31¼@32½, with transactions amounting to 1480 shares. The dealings in Bechtel were confined to Saturday and yesterday, selling on the first-named day at \$2.10@2.05, and yesterday at \$1.90@1.80, with total transactions of 900 shares. Bulwer has been quiet and weak, the sales amounting to but 760 shares at \$10½@10. Consolidated Pacific records but 200 shares at \$4.45@4.25. The sales of Goodshaw aggregate but 400 shares at 38@35c. The sales of May Belle on Monday and Wednesday amounted to 1400 shares at 25@21c.

The North Standard farce continues. The sales reported amount to 2100 shares at \$1.85@2.15. Leave it alone. South Bulwer has made its appearance, with sales of 5300 shares at \$1.05@1.45. Our inquiries do not lead us to suppose that this mine has any such value, as the operators in it are trying to give it at the exchange.

The Tuscarora stocks have had a liberal business. Belle Isle sold as high as \$1.60 on Tuesday, but dropped to \$1 on the following day, upon the announcement of a 30c. assessment. The price recovered to \$1.20 to-day. The sales for the week amount to 3680 shares. There was a business of 200 shares in Grand Prize to-day at \$1.40@1.45. Under a liberal business, Independence has been stronger. The sales amount to 2580 shares at 83@95c. There was a sale of 100 shares of Martin White to-day at \$1. The sales of Navajo amount to 1100 shares at 40@35c. Tuscarora, under an assessment, sold down to 12c., but recovered to 21c. to-day, with transactions for the week of 25,010 shares.

The miscellaneous San Francisco stocks have been quite dull. Eureka only records 165 shares at 16¼@16½c. Caledonia (B. H.) only records 125 shares at \$3.25@3.10. This company does not more than collect one assessment before another is levied. It is about time some change of programme was made. Tip Top has advanced from \$3.25 to \$3.75, with sales of 930 shares.

The business in stocks under Eastern representation has been very large. Caribou records sales of 2775

shares at \$4¼@6. The speculation in Central Arizona continues to be quite important, the sales amounting to 12,660 shares at \$13¼@12. Climax has ranged between \$3¼ and \$3.60, with sales, of 7155 shares. Deadwood has been quiet but stronger, the sales amounting to 470 shares at \$21@22½. Excelsior advanced from \$22 to \$23½, with sales of 495 shares. Findley has been quiet, with sales of 3900 shares at 60@66c.

Great Eastern has been very active and stronger. The sales amount to 76,800 shares at 52@60c. Hukill has been quite speculative and somewhat weak. The sales amount to 27,745 shares at \$4.80@4.30. The sales of La Plata amount to 1800 shares at \$6¼@6. Leadville has been very active, and attracted more attention than any other stock on the list. The sales aggregate 54,315 shares, selling from \$3.90 on Saturday down to \$3.10 on Wednesday and recovering to 4¼ to-day. Early in the week, it was said that the late President of the company was unloading, and that "shorts" were being put out, and that since then the latter have been having a squeeze. Little Pittsburg has ranged between \$26 and \$28½, with sales of 1975 shares. Moose has been very active and weak, the sales amounting to 20,960 shares at \$2.40@2, recovering to \$2.20 to-day. It is said that there has been some misunderstanding among those who have been supporting the stock for a couple of years, and that the insiders have been throwing it upon the market freely. Ontario has been stronger but quiet. The sales amount to 127 shares at \$38@39. Plumus has been very quiet, the sales amounting to but 500 shares at \$2.60@2.65. Mariposa Common records 200 shares at \$4@3.50. The Quicksilvers have had a fair business, especially the Common, which records 6950 shares at \$21@20. In the Preferred, the sales have amounted to 1300 at 67¼@66c.

Rappahannock has been quiet and weak. The sales amount to 13,200 shares at 38@36c. Shamrock has been quiet, but stronger. The sales aggregate 2800 shares at \$1.10@1.25. South Hite still commands a large business. The sales amount to 14,125 shares at \$3.05@3.35. Suro Tunnel has had a very good business, but has been weak. The sales amount to 14,125 shares at \$3.05@3.35@3.10.

The fancies have been without special feature. The sales have been as follows: American Flag, 2900 shares at 44@48c.; Buckeye, 49,000 at 61@56c.; Dahlonega, 7900 at 17@19c.; Gold Placer, 8700 at 27@30c.; Granville, 15,000 at 45@41c.; Lacrosse, 26,000 at 52@45c.; Lucerne, 2700 at 20@16c.

A telegram from the superintendent of the Hukill mine, dated January 27th, says: "Hukill has run into rich gold ore on the second level north. Third level will open immense, I think."

The production of the Ontario Co. for the first 23 days of this month, was \$89,863.73, and the mill was closed for three days.

Prof. W. P. Blake is now at the Green Mountain mine making an examination for the company. The developments in the new level are most satisfactory.

Books will be opened for subscription for about 40 per cent of the stock of the Freeland Mining Co., of Idaho Springs, Colo., within 10 days. Capital, \$5,000,000; 200,000 shares; par, \$25. Dividends will commence in April.

The price of seats in the Mining Exchange have advanced to \$1100, against about \$80 a year ago.

The U. S. Mining and Investment Co. announces great success in placing the stock of the Spring Valley Hydraulic Mining Company, and that the subscription-books will be closed next week.

The receipts of the Trio Gold and Silver Mining Company for December were \$1179.77, and expenses \$1564.17. It is estimated that there was \$2000 worth of ore on the dump.

The annual meeting of the Granville Mining Company was held on the 28th inst., and the following directors elected: Gen. John E. Mulford, G. B. Flint, Edwin H. Mulford, F. A. White, and William Brandreth. The general superintendent reports that since the water was turned on in November 4836 dwts. of gold have been shipped.

The following appears as postscript to the San Francisco News Letter:

"WARNING!—The following letter, very fortunately for the public, fell into our hands to-day:

"January 16, 1880.
"Esq.: Buy Bodie Consolidated stock, now selling at about one third its actual worth, with prospective value beyond computation. Rich develop-

ments and increased dividends impending. Will soon start again on high-grade ores, of which the mine abounds, having cleaned up the dumps for some time past. No better or safer investment on this Coast. Act promptly, "L."

"Now, by dint of diligent investigation, for we suspected something crooked at once, we have discovered that copies of this same 'point' had been sent to hundreds, perhaps thousands, of unsuspecting people in this city.

"We looked still further into the matter, and found that prominent 'insiders' are unloading the Bodie Consolidated with a dispatch that is unequalled in the past records of the stock market. Last week, in our stock article, we expressed our belief that the present dividend on this stock would be its last. The letter quoted above, the mysterious and anonymous way in which it has been so liberally distributed, and the harrowing anxiety of those who hold the stock to throw it on the market, is amply sufficient evidence that there is a gigantic swindle on foot.

"We, therefore, warn all people against buying or holding 'Bodie Consolidated.' Again we say, fight shy of it!"

There has been so much rascality in connection with the operations in this stock that there is no knowing whether the mine is played out or a new bonanza discovered. When the old stock was selling at \$48@50 per share last summer, a prominent banking-house in this city received a forged dispatch advising it to have its customers buy all of this stock that they could. But the dispatch was not sent in the regular way, and was not acted upon. The Bodie rings are becoming worse than the Comstock, and, although the district affords several excellent mines, yet, unless the public is dealt with more fairly, the whole district will be shunned.

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

NAME OF COMPANY	CLOSING QUOTATIONS.						Open- ing.
	Jan. 23.	Jan. 24.	Jan. 26.	Jan. 27.	Jan. 28.	Jan. 29.	
Alpha.....	10½	10½	10½	10½	10	10	10
Alta.....	4¼	4½	4½	4½	4½	4½	4¼
Argenta.....	1½	1½	1½	1½	1½	1½	1½
Bechtel.....	2	2	1¾	1½	1½	1½	1½
Belcher.....	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Belle Isle.....	1½	1½	1½	1½	1½	1½	1½
Belvidere.....	1	1	1	1	1	1	1
Best & Bel.....	13¼	13¼	13¼	13¼	12¾	12¾	12¾
Black Hawk.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Bodie.....	8½	8½	8½	8½	8½	8½	8½
Boston Con.....	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Bullion.....	5¼	5¼	5¼	5¼	5¼	5¼	5¼
Bulwer.....	11	11	11	11	11	10½	10½
Caledonia.....	1¾	1¾	1¾	1¾	1¾	1¾	1¾
Cal. B. H.....	3¾	3¾	3¾	4	4	4	4
Choiar.....	8¾	8¾	8¾	8¾	8¾	8¾	8¾
Con. Imp.....	4½	4½	4½	4	4	4	4
Con. Pacific.....	3½	3½	3½	3½	3½	3½	3½
Con. Va.....	5½	5½	5½	5½	5½	5½	5½
Crown Mint.....	11-16	11-16	11-16	11-16	11-16	11-16	11-16
Dudley.....	17	16½	16	16	16	16	16
Eureka Con.....	3½	3½	3	3½	3½	3½	3½
Exchequer.....	13-32	13-32	13-32	13-32	13-32	13-32	13-32
Goodshaw.....	6	5¾	5½	6½	6	5½	5½
Gould & Cur.....	1½	1½	1½	1½	1½	1½	1½
Grand Prize.....	8½	8	7¾	8	7¾	7¾	7¾
Haie & Nor.....	1½	1½	1½	1½	1½	1½	1½
Hillside.....	20-32	20-32	20-32	20-32	20-32	20-32	20-32
Independence.....	2¼	2¼	2¼	2¼	2¼	2¼	2¼
Julia Con.....	2¼	2	1¾	2¼	2¼	2¼	2¼
Justice.....	2¼	2¼	2¼	2¼	2¼	2¼	2¼
Kentuck.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Lady Wash.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Leeds.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Leopard.....	27-32	27-32	27-32	27-32	27-32	27-32	27-32
Leviathan.....	23-32	23-32	23-32	23-32	23-32	23-32	23-32
Mammoth.....	23-32	23-32	23-32	23-32	23-32	23-32	23-32
Manhattan.....	1½	1½	1½	1½	1½	1½	1½
May Belle.....	3-16	3-16	3-16	3-16	3-16	3-16	3-16
Mar. White.....	1	1	1	1	1	1	1
McCintion.....	19	18½	19	19½	18¾	18¾	18¾
Mexican.....	7¾	7¾	7¾	7¾	7¾	7¾	7¾
Navajo.....	11-32	11-32	11-32	11-32	11-32	11-32	11-32
North Belle.....	9½	9½	10¼	10½	10½	11	11
N. Bonanza.....	11-16	11-16	11-16	11-16	11-16	11-16	11-16
N. Standard.....	5	4¾	4¾	4¾	4¾	4	4
Nooday.....	19	18½	18¾	19½	18¾	18¾	18¾
Ophir.....	8¾	7¾	7½	8¼	8¼	8	8
Orig. Kys'e.....	5¼	5	4¾	5¼	5½	5	5
Overman.....	29-32	29-32	29-32	29-32	29-32	29-32	29-32
Potosi.....	1¾	1¾	1¾	1¾	1¾	1¾	1¾
Ray & Ely.....	7¾	7¾	7¾	7¾	7¾	7¾	7¾
R. de Monte.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Savage.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Scorpion.....	23-32	23-32	23-32	23-32	23-32	23-32	23-32
Seg. Belcher.....	23-32	23-32	23-32	23-32	23-32	23-32	23-32
Sierra Nev.....	23-32	23-32	23-32	23-32	23-32	23-32	23-32
Silver Hill.....	7	6	6	6	6	6	6
Silver King.....	1	1	1	1	1	1	1
So. Bulwer.....	1	1	1	1	1	1	1
Summit.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Syndicate.....	13-16	13-16	13-16	13-16	13-16	13-16	13-16
Tioga.....	3	3	3	3	3	3	3
Tip Top.....	3½	3½	3½	3½	3½	3½	3½
Trojan.....	5-16	5-16	5-16	5-16	5-16	5-16	5-16
Tuscarora.....	1-16	1-16	1-16	1-16	1-16	1-16	1-16
Union Con.....	44	43¼	40½	48	46	43¾	44¾
Utah.....	4	5¼	5	5¾	5	3¾	16
Wales.....	12½	11¾	10¾	11¼	11¼	11	11
Vel. Jacket.....	12½	11¾	10¾	11¼	11¼	11	11

REVIEW OF THE SAN FRANCISCO MARKET.

The San Francisco market, if any thing, is lower, yet but little change is observed in the general tendency of prices, and we record a steadier feeling than observed for some time past. It is generally conceded that an announcement, based upon facts, of the discovery of a rich bonanza in the lower levels, now being so diligently prospected, coupled with the large

GENERAL MINING STOCKS. Dividend Paying Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Fret 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 (Jan. 24, Jan. 26, Jan. 27, Jan. 28, Jan. 29, Jan. 30), SALES.

Non-Dividend Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Fret 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 (Jan. 24, Jan. 26, Jan. 27, Jan. 28, Jan. 29, Jan. 30), SALES.

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

sums of unemployed capital, which are said to be waiting the opportunity for investment, would together form the basis for another bonanza furor, such as took possession of the good people of San Francisco on many previous occasions. Apropos of this, it is stated that San Francisco is the only city which shows a decrease in exchanges, the cause being chiefly attributable to the trouble in the Comstocks and other mining securities.

Speaking of the Comstock, the San Francisco Chronicle says:

"We repeat there is a possible chance to develop a bonanza in the deep levels of the Comstock, but the biggest bonanza in sight is the privilege granted those who have control of the mines—the distribution of assessment money. To work this bonanza in all its dips, spurs, and angles and obtain the legitimate (?) profits thereof, it is not singular that a deal is occasionally inaugurated to induce a cheerful submission to those in authority. And these are kept in control through the present proxy system that prostitutes the rights of the great majority to the cupidity of a small minority. Let the Legislature once pass a law requiring bona fide owners to vote at annual elections, or those who give proxies to make oath that they are the sole proprietors of the stock which they represent, and the first step toward permanent reform in mine management will have been accomplished."

The Bank of California has declared a dividend of 10 per cent per annum for the last quarter of 1879. This dividend is on the reduced capital stock, which is now \$3,000,000, the shares of which have been selling at 125, and parties disposed to sell ask 128.

At the Comstock north-end mines, the Sierra Nevada, as well as the Union Consolidated, the north-end ore channel appears to be bulging out to the eastward. On the 2300 level, they have run out 40 feet, and obtained a body of ore 20 feet in width, which gives fair assays.

Union Consolidated opened at 44½, which is quite a decline from the best price of the week; on the 27th, it reached \$48; the quotation to-day, however, is rather an improvement on that price a week ago. The north end of this mine is yielding a liberal quantity of ore.

The north drift on the 2700 level of the Crown Point has entered Kentuck ground. It is now to be continued on to the Yellow Jacket line, a distance of 100 feet, and then the ground passed through will be thoroughly prospected by cross-cuts. The workings in this part of the vein are similar to the Yellow Jacket, Crown Point, and Belcher.

This stock opens at the lowest price of the week, namely, \$4½ per share, a decline of \$1½ from our last. This company's shaft has attained a depth of 2850 feet, the bottom in quartz, porphyry, and dyke.

South Bulwer shows somewhat of an improvement, closing yesterday at \$1½.

Belcher opened to-day at \$11½, against \$10¾ a week ago. This company levied an assessment yesterday of \$1 per share. It is thought that the outlook on the 2700 level is very good. The cross-cut on the 2000 level will not reach the ore-body for some weeks. The result is looked forward to with great interest. California has been steady during the week, opening to-day at \$4, the same as quoted a week ago. The annual report of the Secretary of this company shows that the total receipts during the year, including \$633,547 in bullion, and \$4108 cash on hand last year, were \$3,243,406, less the disbursements, leaving \$1333 cash on hand at date, and \$48,612 in bullion.

Lady Byron has been actively dealt in on the San Francisco market recently, and selling down to 15c. per share. A despatch dated Virginia City, Jan. 21, says:

"It is almost needless to say that the Lady Byron bubble has burst. Visitors report the ledge regular in formation, but the rock assays only from \$1 to \$2. The highest was \$31.60. Everybody is thoroughly disgusted. The native silver said to have been horned out of the ore proves to be solder. Kelly says the miners salted the drill holes on him, and people say Kelly salted the mine on them."

Hillside closed yesterday at 1½ per share. This stock has been steady during the week. The new furnaces of this company are running well. The company has a large amount of ore on hand, and the prospects for a good run are very favorable.

Recent sales of Belmont have been made on the San Francisco market at 55¢ per share. The published statements from this mine are very encouraging. The stock of the Star Mining Company has sold in San Francisco recently at 30c. per share. The Secretary of this company says that there is no truth in the report that the mine had been attached and the works shut down. He says work is going on as usual, and that on January 1st a shipment of \$6800 was made.

The Commercial Herald of January 20th says of the market:

"The past week has been one of increased activity in the mining share market, and, while a recession has taken place in some stocks, the feeling among all classes interested in this class of securities appears to be buoyant for an upward movement of the Comstocks, some predicting that the north end will be the first to boom, while others hold that the movement will be northward, commencing with Belcher, and that the recent advance of the latter was checked by the insiders, though the turn must have been a very profitable one, for the purpose of breaking it until the deal can again go forward with still better profits. The large amount of idle capital here seems to be ripening into a condition to be placed wherever it is thought to gain a speedy profitable return, and the speculative form, which we believe will be brought about in the stock market, is likely to absorb a very large amount. The tendency certainly is toward a very brisk market in mining shares."

The Assessment Record.—Following is a list of outstanding assessments upon stocks listed at the San Francisco Stock and Exchange Board, with the dates upon which they will become delinquent in the Board:

Comstocks.	Amount.	Delinquent in Board.
Lady Bryan.....	\$0.50	January 27
Europa.....	10	" 30
Mountain View.....	25	" 31
Silver Hill.....	50	February 2
Mackey.....	15	" 3
Sierra Nevada.....	3.00	" 6
Gould & Curry.....	1.00	" 6
Scorpion.....	25	" 6
Mexican.....	2.00	" 10
Exchequer.....	50	" 13
Hale & Norcross.....	1.00	" 14
Crown Point.....	50	" 15
Bodies.....		
Booker Con.....	20	" 20
South Bodie.....	10	" 16
Miscellaneous.....		
Independence.....	30	" 13
Albion.....	10	" 15
Gila.....	25	" 15

The Dividend Record of Pacific Coast Mines for 1879.—The Bulletin of January 21st publishes the following table:

Name.	Location.	Div's.	Amount.
Argenta.....	Nevada.....	1	\$20,000
Belle Isle.....	Nevada.....	6	300,000
Bodie Con.....	California.....	6	350,000
California.....	Nevada.....	5	1,620,000
Consolidated Virginia.....	Nevada.....	5	1,350,000
Consolidated Amador.....	California.....	1	7,500
Excelsior.....	California.....	7	147,000
Eureka Consolidated.....	Nevada.....	12	825,000
Father De Smet.....	Dakota.....	1	30,000
Great Western Quicksilver.....	California.....	1	12,500
Homestake.....	Dakota.....	12	360,000
Idaho.....	California.....	12	168,950
Independence.....	Nevada.....	3	75,000
Indian Queen.....	Nevada.....	1	12,000
Martin White.....	Nevada.....	3	90,000
North Bloomfield.....	California.....	1	90,000
Napa Con. Quicksilver.....	California.....	2	20,000
Ophir.....	Nevada.....	1	100,800
Ontario.....	Utah.....	12	600,000
Standard Consolidated.....	California.....	12	600,000
Total.....			\$6,778,750

Coal Stocks.

NEW YORK, Friday Evening, Jan. 30.

The market for coal stocks has been very steady during the week; the closing prices generally show an advance on those quoted in our last. The sales aggregate 289,098 shares, as against 256,257 shares in our last. In the stock of the Delaware, Lackawanna & Western Railroad Company, increased activity is noted. The extreme prices were \$83½@87½, the higher figure representing the quotation to-day. The annual statement of the company's operations for the year just closed is published, from which we make the following extracts:

Gross earnings from all sources.....	\$19,942,290.93
Less expenses.....	16,151,839.20
Balance, net earnings.....	\$3,810,541.73
Deduct interest on bonds and rentals leased roads.....	\$3,624,480.60

Actual profit for year ending December 31, 1879, \$186,021.07; add surplus income to December 31, 1878, \$4,346,125.01; total, \$4,532,146.08. By order of the Board of Managers, the entire cost of the change of gauge—heretofore kept as an asset, and consequently included in the surplus income of past years—has been entirely written off the books of the company—namely, \$873,809—leaving income account surplus December 31st, 1879, \$3,658,337.05; coal tonnage moved in 1879, 3,968,101 tons.

Pennsylvania Railroad stock has been quite steady, 53,452 shares changing hands.

New Jersey Central has ranged between 79½@83 with a record of 37,915 shares sold. Philadelphia & Reading almost duplicates the sales quoted in our last; the final prices being 68½@68¾, and the sales 43,928 to 43,029 this week, as compared, respectively, with the figures in our last. In the remaining portions, there is no special feature, the business being pretty equally distributed.

Copper and Silver Stocks.

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

Boston, Jan. 29.
The week under review, although less active than its predecessor, has shown a good degree of strength in prices, especially for the copper-producing mines, and we have to record a marked advance in some of the leading specialties, notably the Quincy mine, which, notwithstanding it is now quoted, dividend off (\$3), reached to-day higher figures than ever.

Calumet & Hecla shows a decline of about \$5 for the week; highest price, 243, closing 238 bid, 240 asked. Central inactive, with but little stock in the market; 44 is bid; ex-dividend, \$5; none offered under 47.

Copper Falls sold early in the week at 7½, but the announcement of an assessment of \$3 per share weakened the market, and caused a decline to \$5, which was the closing bid to-day.

Franklin has been very steady at 44½@45, with an occasional sale a fraction over or under these figures; closing price, 44¾@44¾.

Osceola, steady at 41½@40 ex div., \$1.50 per share (not \$1, as stated in our last report), and closed at 40 bid.

Nevada sold at 65 in the early dealings, but later declined to 62, and closed offered at that price.

Quincy opened at 37¼ ex dividend (\$3), and rapidly advanced to 46 to-day, closing, however, weak at a decline to 43 bid, 43¼ asked.

Ridge steady at 8¼@9¼, closing at 8¼@9. A dividend of 50c. per share has been declared.

Atlantic shows an advance of \$2 for the week, with sales at \$25, which was the asking price.

Phoenix holds the advance of last week well, closing at 14¾ bid.

We quote closing prices of other stocks as follows:

Mesnard, 37½@4.
Blue Hill, 8¼@87½.
National, 5¼@5½.
Minnesota, 5½.
Pontiac, 7½@1.
Rockland, —@1¼.
Superior, —@1.
Star, 1¼@2.
Washington, 16@¾.
Winthrop, 76@1.
Humboldt, 1¼@1¾.
Hungarian, —@¾.
Manhattan, —@1.

SILVER STOCKS.

Duncan Silver dull and inactive at 4½@4¾.
International, 55@60c.
Silver Islet, 23@25.
Sullivan, 11½@11¾.

Gas Stocks.

NEW YORK, Friday Evening, Jan. 30.

The market for gas stocks continues strong, with a good demand for New York stocks. The Brooklyn and the Jersey City Gas Companies have declared dividends of 5 and 7½ per cent respectively.

The following list of companies in New York and vicinity is corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 24 Broad street, New York.

COMPANIES IN NEW YORK AND VICINITY.	Capital Stock.	Par.	DIVIDENDS.		QUOTATION.	
			Rate per ann.	Am. last.	Date of last.	Bid.	As'd.
Mutual, N. Y.	\$	P. ct.				
" Bonds.....	5,000,000	\$100	6	1½	July, '79	50 57½
" ".....	900,000	1,000	6	3½	Feb., '80	100 104
N. York ".....	4,000,000	100	8	4	May, '79	90 95
Metrop. ".....	2,500,000	100	10	3½	Feb., '80	118 125
" Certfs.....	1,000,000	100	7	3¼	Feb., '80	95 100
Harlem ".....	1,850,000	50	6	3	Feb., '78	40 45
Manhat. ".....	4,000,000	50	5	5	June, '79	152½ 160
Brooklyn, Bkln. ".....	2,000,000	50	15	5	Nov., '79	115 120
Nassau ".....	1,000,000	25	2	2½	Jan., '80	50 55
" Certfs.....	700,000	1,000	7	3½	Nov., '79	85 95
People's.....	1,000,000	10	7	3½	Jan., '78	25 30
" Certfs.....	250,000	1,000	7	3½	Jan., '80	75 85
" Bonds.....	375,000	100	7	3½	Nov., '79	90 95
Metrop. ".....	1,000,000	100	5	2½	Jan., '80	50 60
W'msb'g ".....	1,000,000	50	8	1½	Feb., '80	65 75
" Certfs.....	1,000,000	100	7	3½	Jan., '80	90 100
Citizens'.....	1,200,000	20	7	2½	July, '79	80 85
" Bonds.....	315,000	1,000	3	3	Oct., '79	100 105
J. C. N. J.....	750,000	20	10	7½	Jan., '79	145 155
Municipal, N. Y. ".....	2,000,000	100	12	5	Jan., '80	140 150
" Bonds.....	750,000	100	7	3½	Nov., '79	105 110
Fult'n M'ncipal.....	1,500,000	100				70 90

THE BULLION MARKET.

NEW YORK, Friday Evening, Jan. 30.

As we considered probable in our previous issue, the silver market has since weakened and may be regarded as rather nominal and inanimate at the figures given above, with the chances in favor of a slightly lower range in the near future.

DAILY RANGE OF SILVER IN LONDON AND NEW YORK, PER OZ.

DATE.	London		DATE.	New York	
	Pence.	Cents.		Pence.	Cents.
Jan. 24.....	52¾	114	Jan. 28.	52¾	113¾
Jan. 26.....	52¾	114	Jan. 29.	52 9-16	113¾
Jan. 27.....	52¾@¾	113¾	Jan. 30.	↑	113¾

* 52¾, weak. + 52 9-16, weak.

BULLION SHIPMENTS.

We give below a statement showing the latest published bullion shipments, in addition to those announced in our issue of January 24th:

Dec. 27—Jan. 3. Butte City.....	Mont.	\$36,588
Jan. 4.....	Tiger.....	15,680
" 3—10. Silver Reef.....	Utah.....	20,773
" 10.....	Manhattan Mill, Austin.....	10,137
" 13.....	Bodie.....	13,329
" 14.....	Stormont, 4 bars.....	7,539
" 14.....	Christy, Silver Reef.....	5,898
" 16.....	Silver King (concentrations, Ariz.).....	1,000 lbs.
" 16.....	Hillside.....	\$6,900
" 16.....	Raymond & Ely.....	6,148
" 17.....	Consolidated Virginia.....	44,454
" 17.....	California.....	56,340
" 14—17. Northern Belle.....	Nev.	10,797
" 10—17. Eureka Consolidated, bul- lion.....	Nev.	233,488 lbs.
" 17.....	Central City, bank.....	\$4,800
" 17.....	Gold Hill.....	\$7,497
" 17.....	Union Consolidated.....	26,312
" 17.....	Ophir.....	16,995
" 10—17. Eureka (passing bullion).....	Nev.	18,834

Table listing mining companies and their stock values, including Richmond, Grant Smelting Company, La Plata Mining and Smelting Co., American Smelting Co., etc.

COAL STOCKS.

Table of coal stocks with columns for Name of Company, Capital Stock, Shares, and Quotations of New York stocks based on the equivalent of \$100 Philadelphia prices.

* Of the sales of this stock, 28,529 shares were sold at the Philadelphia Stock Exchange, and 14,500 at the New York Stock Exchange. Total Sales..... 289,098.

BOSTON MINING STOCKS.

Table listing mining companies and their stock values, including Eureka Consolidated, Eureka (passing bullion), Central City, etc.

Table of Boston Mining Stocks with columns for Name of Company, Jan. 23, Jan. 24, Jan. 26, Jan. 27, Jan. 28, Jan. 29, and Sales.

c. Copper. s. Silver. * 1 11-16. † 11 3-16.

During the past year, \$1,942,403 bullion were shipped from Arizona by Wells, Fargo & Co.'s Express.

The Silver World, from the San Juan section, gives the production of the Crooke Works for the year 1879 as being \$96,382.

Arizona.—The bullion shipments from Arizona for 1879, per express company, had amounted in gold to \$66,036.48; in silver, to \$212,614.64.

The Globe City (Ariz.) Silver Belt of January 10th says: "The amount of bullion extracted by the Stonevale Mill and Mining Company during the month of December, 1879, was \$15,099.

The Eureka Sentinel of January 10th says: "Previous to commencing the present shipments, about 5000 tons of lead have accumulated at the Richmond furnaces.

East Bobtail.—The gold-product of this mine for the month of December amounts to \$4207.

Leadville (Colo.) Smelters.—Below we give the amount produced by the several smelters at Leadville for the week ending January 24th:

Table showing production statistics for Leadville smelters, including Pounds of bullion produced, Ounces of silver, and Value of silver.

There can be added to this the ore sampled and shipped by Eddy & James, amounting, for the week, to \$115,794.

Utthoff & Company give the following estimates of the output in tons of the Leadville mines per day for the week ending January 17th: Chrysolite, 125; Little Pittsburg, 125; Little Chief, 50; Dunkin, 10; R. E. Lee, 40; Climax, 20; Carbonate, 35; Yankee Doodle, 5; Morning Star, 40; Colorado Prince, 5; Nevada, 5; Crescent and Etna, 5; Long & Derry, 5; Pendery and Glass, 5; Forsaken, 20; Agassiz, 5; Iron Mine, 25; Smuggler, 5; Tucson, 5; Silver Wave, 10; Little Ella, 5; Highland Chief, 30; Argentine, 10; Little Giant, 15; Oro La Plata, 20; Scooper, 10;

Miner Boy, 5; Double Decker, 2½; others, say altogether, 35. Total, 667½ tons.

The Free Coinage Bill.—The Warner Free Coinage bill in Congress to stop paper inflation and provide for the increase of the volume of currency by the free coinage of gold and silver and gold and silver certificates has been up and amended.

San Francisco Treasure Imports and Exports.—The San Francisco Commercial Herald of January 15th gives the following interesting statistics:

Table showing San Francisco Treasure Imports and Exports for 1878 and 1879, including From Northern and Southern mines, Coastwise, North and South, Imports, foreign, and Totals.

Our treasure exports, during the last three years, have been as follows, exclusive of shipments through United States mails:

Table showing treasure exports for 1877, 1878, and 1879, including To New York, England, China, Panama, Japan, and other countries.

The description of coinage for 1876, 1877, 1878, and 1879 was as follows:

Table showing description of coinage for 1876, 1877, 1878, and 1879, including Double Eagles, Half Eagles, Quarter Eagles, Trade Dollars, Half Dollars, Quarter Dollars, Dimes, and Standard Dollars.

Totals \$42,704,500 \$49,772,000 \$50,186,500 \$38,065,750

U. S. Purchase of Silver Bullion.—WASHINGTON, Jan. 29.—The Treasury Department purchased to-day 615,000 ounces fine silver for delivery at the Philadelphia, San Francisco, and New Orleans mints.

Exports of Gold and Silver from New York.

Table showing exports of gold and silver from New York, including Week ending January 24th, Corresponding week last year, Since January 1st, and Corresponding period last year.

Gold Interest Paid Out by the Treasury. Week ending January 24th..... \$542,363

meager proportions as during the past year. This has come in part from the low prices ruling in this market, and in part from the falling off in shipments of high-grade silver ores from Arizona, where increased facilities for reduction have had the effect to retain a larger share of them in the country. Value of ores received from that section amount for the year to about \$400,000, being mostly on account of Silver King concentrations, which still come to this market. From the silver mines of Inyo County, Cal., but little ore has been sent forward of late. Receipts of copper ores make hardly so good a showing as those of silver, operations in our home mines having been greatly restricted for some time past. At the Spencerville mines, near Marysville, work by the lixiviation process has been begun, and some of the products sent to market. Large works have been erected at that point, and as the method of treating the ores there adopted promises good results, a considerable reduction is looked for the current year. From the mines of Del Norte County, several small lots of high-grade copper ore have come to hand the past summer, causing a contract to be entered into by the owners of these mines, providing for the early delivery here of 600 tons of equally high-grade ores, some of which, it is said, will carry a large percentage of native metal. The Newton mine, Amador, has recently been put in condition for renewed operations, and will turn out considerable copper ore the coming season, the lixiviation plan being also in use. The Eagle mine, Calaveras, for several years an active producer, did little last year, the property being involved in litigation. This disposed of, as it promises soon to be, ore extraction will there be resumed. With the late improvement in prices of ore, copper mining will no doubt experience an early revival on this coast. Receipts of antimony, nickel, and, in fact, of all other ores during the year have been merely nominal. It does appear to us strange that more attention is not given to the vast iron-ore mines of the Pacific Slope. They are rich, inexhaustible, and very valuable.

Silver as a Medium in Austrian Commerce.—WASHINGTON, Jan. 29.—Mr. Weaver, United States Consul-General at Vienna, in a dispatch to the Department of State, dated December 31st, says: "The premium on gold over silver at the custom-houses is 15 per cent. Paper money is at par with silver. The coinage at the mints last year was chiefly of silver."

METALS.

NEW YORK, Friday Evening, Jan. 30.

The metal market has been quiet, yet, nevertheless, firm, with indications of higher prices to follow soon.

Copper.—But a very small business is reported in this article. At the close the spot price is 24½c., while for futures, 24¼@25c. is asked. Prices have advanced still further in London, Chili Bars being quoted at £73 10s., and Best Selected, £82 10s.

The actual stocks in Europe on the 15th inst. were 2425 tons less than at the beginning of the year, while, with mail and telegraphic advices, they were 1659 tons less, and the price of Chili Bars was £5 higher.

London advices of January 16th say:

"There is a lull in the demand for Chili Bars, the charter news being shortly expected, and the only sale reported today was one of 50 tons, G. O. B's., short fixed prompt, at £70 without brokerage. On these terms, a few other parcels might be had, but the same figure, with customary conditions, has been refused.

"Australian is steady at £75@£76 for Burra, £76@£77 for Wallaroo Cake, though not much doing.
"Values of English rule as follows: Tough Cake £73@£75; Satec Ingot £73@£78; Ingot Sheets £78@£80. Yellow Metal Sheets, 6¼@6½d. per lb."

Tin.—We note sales of 100 tons on spot at 24¼c., and 100 tons to arrive at 24½c. London quotes: £98@£100; Singapore, \$31, and Penang, \$30.25 with exchange at 3s. 10½d. Our closing quotations are: Straits, 24¼@24½c; L. & F., 23¼@24c; Refined, 24c., and Billiton and Australian, 24@24½c.

London advices of January 16th say of tin:

"There has been a strong inquiry all the day for this metal, but, although fully 400 tons changed hands, there is scarcely any alteration to note in market quotations. Early this morning, a moderate trade was done at 94½s. cash, 95s. @95½s. forward deliveries, and shortly afterward 94½s. cash was paid. Buyers then came forward freely, and took a large line at 95s. cash. We closed firm at this figure to 95½s."

Tin Plates.—There has been a very good business in these. We quote per box, as follows: Charcoal tins, ½ X Melyn grade, \$10.25@£10.50; Allaway grade, \$9.87½@£10, and ternes, \$9.25. Coke tins, B. V. grade, \$8.75@£9, and ternes, \$8.62½.

Messrs. Robert Crooks & Co., of Liverpool, under date of January 15th, say of Tin and Terne Plates:

"Between the evenings of 7th and 8th instant, an advance of 3s. per box was obtained for some descriptions. This increase has since been firmly held for by makers, who can, for the most part, keep out of the market for some time without inconvenience. We quite expect to see speculative lots re-selling at lower rates shortly; but, these cleared off, the still advancing cost of material must prevent a fall in makers' prices."

Lead.—A sale of 1000 tons of Richmond lead to arrive is reported at 6c., and 400 to 500 tons here at the same price. At the close, 6'05@6½c. is asked. The foreign market is very strong and advancing. The quotation to-day was £19 5s. @£19 10s., c. f. i., New York, equal to about 6½c. here.

The San Francisco Commercial Herald, in reviewing the lead trade and production for 1879, says:

"While a portion of the lead produced in the Eureka Dis-

trict the past year was received by the Selby Smelting Works, in this city, the bulk disposed of was sent East to Newark, N. J., for separation and refining. A great deal of the crude bullion made at that place has been stored, being held for a further advance in the price of lead, now confidently looked for. Tybo and other lead-producing districts in Nevada have also sent most of their product East of late, leaving the works here to depend on other sources for their supplies, some of which have been drawn from Castle Dome, in Arizona, from which late shipments have, however, been small and irregular. The lead turned out at the Selby Works last year amounted to about 125 tons per month, all of which was required for the coast trade or home consumption. With some promised revival of mining in the lead-producing districts of California, receipts of base bullion at this point promise some increase the present year.

"Our shipments, by sea, of lead for—

	1878.		1879.	
	Tons.	Value.	Tons.	Value.
New York.....	11,027	\$902,378	6,162	\$555,530
China.....	4,775	393,808	150	10,000
Japan.....	360	27,700	101	7,622
Victoria.....	32	2,987	.....	.....
England, etc.....	147	25,027	.....	.....
Totals.....	16,341	\$1,351,900	6,413	\$573,162

"While the Richmond Company will be likely to double the quantity the current year, the Eureka will maintain their present rate of production and possibly increase it. The same will probably be the case with other companies."

Spelter and Zinc.—Spelter has had a fair business, and is quoted at 6¼@7c. Sheet zinc is without notable feature and quoted at 8@8½c.

Antimony is very strong. All lots on spot and to arrive, have been taken up by strong parties, and it is now said that makers in England will not book any more orders for 1880. Johnson & Mathys's and Hallett's are quoted at 21c., and Cookson's at 23c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan. 30.

American Pig.—The market is more quiet, and some pronounce it weaker, although we can only observe the absence of fancy quotations. It was impossible to continue the business that was doing early in the year; there would not have been the iron to supply the demand, had the latter been continuous. Although consumers may be well supplied with iron for immediate wants, yet makers are equally well supplied with orders; and, outside of a few lots held by speculators, there is not likely to be any weakness shown in prices. This state of things may continue for some time, when, after buyers become familiarized with the present prices, a basis will be established for a further advance. We note a sale of 1000 tons of Chestnut Hill forge iron at \$40 at Pittsburg, and 1000 tons of Thomas forge at \$37.50 here. There have been other sales in a small way, but not worthy of particular mention. We quote No. 1 Foundry at \$40; No. 2 Foundry at \$38@39; and Forge at \$37@38.

Scotch Pig.—The Glasgow market has declined about 5s. per ton; but this has been partially counteracted, so far as this market is concerned, by an advance of 2s. 6d. per ton in freights. The arrivals have been small. We note a sale of 1000 tons of Eglinton, for delivery in Philadelphia, at \$32. This makes four lots, of about the same size, lately reported for that market. To go to Detroit, on the opening of navigation, 1000 tons of Eglinton have been sold on private terms. There have been other sales in a small way at our quotations. We quote Eglinton at \$32; Coltness, \$34.50; Glengarnock, \$33; and Gartsherrie, \$34.

Messrs. John E. Swan & Co., of Glasgow, under date of January 16th, 1880, report 104 furnaces, against 91 at the same time last year. The quantity of iron in Connal & Co.'s stores was 428,485 tons, an increase of 3413 tons for the week. The shipments show an increase of 4626 tons since Christmas, as compared with the shipments to the same date last year. The imports of Middlesbrough pig-iron for the same period show an increase of 5195 tons. The following are the quotations of the leading brands of No. 1 Pig-iron: Gartsherrie, 87s. 6d.; Coltness, 89s.; Langloan, 85s.; Summerlee, 89s.; Carnbroe, 87s. 6d.; Glengarnock, 87s. 6d.; Eglinton, 80s. Middlesbrough Pig-iron was quoted as follows, f. o. b. Tees: No. 1 Foundry, 68s.; No. 2, 65s.; No. 3, 63s.; No. 4, 63s.; No. 4 Forge, 63s.

Rails.—In steel, business is reduced to small dimensions, owing to the inactivity of the mills to fill orders. We quote at \$83@85 at the mills, and foreign about same prices here. In iron rails, a business of about 10,000 tons is reported at \$63@66 for English, and \$67@70 for American mills.

Messrs. John H. Austin & Co., of London, under date of January 15th, say: "Steel and iron rails are very

firm at our quotations, and orders difficult to place. We quote steel rails at £9 5s. @£10 5s., and iron rails at £8 10s. @£9.

Old Rails.—These are quieter. D. H.'s are quoted at \$44@45 and T.'s at \$43@43.50.

Wrought Scrap.—There has been quite a good business in this at \$42@43.50, while for shipments \$45 is asked.

We publish the following letters from our regular correspondents:

"LOUISVILLE, Ky., Jan. 26.
"The market continues very firm, with a strong tendency to a further advance. Sales continue moderate, in consequence of the small amount of iron offering. We quote for cash as follows:

	FOUNDRY IRONS.	
	No. 1.	No. 2.
Hanging Rock Charcoal.....	\$42.00@43.00	\$40.00@41.00
Southern Charcoal.....	40.00@41.00	38.00@39.00
H'n'g Rock, Stc'l & Coke.....	40.00@41.00	38.00@39.00
Southern Stoccoal & Coke.....	40.00@41.00	38.00@39.00
"Amer. Scotch".....	\$37.00@38	Silver Gray \$35.00@36.00
Scotch Iron.....	37.00@38	

MILL IRONS
No. 1 Charcoal, Cold-short & Neutral..... \$37.00@38.00
No. 1 Stc'l & Coke, Cold-short & Neutral..... 35.00@36.00
No. 2 Stc'l & Coke, Cold-short & Neutral..... 34.00@35.00
No. 1 Missouri and Indiana, Red-short..... 46.00@47.00
White & Mottled, Cold-short & Neutral..... 31.00@32.00

CAR-WHEEL AND MALLEABLE IRONS.
Hanging Rock, Cold Blast..... \$58.00@60.00
Alabama and Georgia, Cold Blast..... 50.00@52.00
Kentucky, Cold Blast..... 48.00@50.00

"GEORGE H. HULL & Co."
"RICHMOND, Va., Jan. 26.
"A firm market and large transactions, were the leading features of the business of the past week. Prime car-wheel iron reached \$60.

Scotch Pig-Iron..... \$35.00@40.00
Amer. Scotch Pig-Iron..... 35.00@37.00
Anthracite "No. 1..... 39.00@43.00
" " "No. 2..... 38.00@41.00
" " "No. 3..... 37.00@39.00
" " "Mottled..... 35.00@37.00
Va. Cold Blast Charcoal Pig-Iron, neutral..... @
" Warm "..... 39.00@43.00
Old Rails..... 39.00@40.00
Wrought Scrap No. 1..... 33.00@34.00
Cast Scrap No. 1..... 30.00@32.00
Richmond Refined Bar Iron..... 0.04@
Horseshoes (Tredegar)..... 5.00@
Mule shoes..... 6.00@
Old Dominion nails (standard size)..... 5 15@5 25

"ASA SNTYDER."
"ST. LOUIS, Jan. 24.
"The market retains its conditions of strength and activity to a remarkable degree, and the tendency is for higher prices.

CHARCOAL HOT BLAST.
Missouri..... \$47.00@49.00
Southern..... 40.00@43.00
Hanging Rock..... 43.00@46.00

COKE AND COAL.
Missouri..... None offering.
Southern, No. 1..... 40.00@42.00
Ohio River, No. 1..... 40.00@42.00
Mill iron, \$40@45, and none offering.

CAR WHEEL IRONS.
Missouri..... 50.00@55.00
Southern..... 52.00@53.00
Ohio..... 55.00@60.00

IRON ORE.
For flux..... 12.00@15.00
Furnace..... 8.00@10.00

"CARD & HOFFER."

THE COAL TRADE REVIEW.

NEW YORK, Friday Evening, Jan. 30.

The state of the anthracite coal trade is very unsatisfactory at present. The mild weather has greatly reduced the demand for domestic sizes, and these are accumulating in large quantities, and can not be disposed of except at considerable concessions. Stove is selling at \$1 to \$1.20 under circular rates, according to the quality of the coal, while chestnut is selling at about 75c. under circular rates. In some instances, broken and egg are a drug; but generally there is a fair demand. The larger sizes used in iron-making and other industries, and the smallest used in steam-making, are in very good request, and the prices are well maintained. The under-cutting of prices, as far as we can learn, is only being done by individual operators, while the large companies are standing firm to circulars. They argue more sensibly than for several years past that, forcing coal upon the market in quantities far beyond the actual requirements, will not make a full demand. There is no united action to curtail production; nevertheless, the crowded state of the stocking ground, at shipping ports, is bringing about a large curtailment, owing to the scarcity of cars and the inconvenience of stocking larger quantities.

The production of anthracite coal last week was 417,390 tons, as against 409,549 tons for the previous week, and 371,706 tons for the corresponding week of 1879. The total production from January 1st to January 24th was 1,256,053 tons, as compared with

1,023,703 tons for the like period of last year, showing an increase this year of 232,350 tons.

SAN FRANCISCO, Jan. 22.

COAL—The market is well supplied, causing low prices. The last cargo sale of West Hartley is reported at \$7.50. Arrivals during the week include: 350 tons, per Arcata from Coos Bay; City of Chester, 500 tons; Hylton Castle, 1479 tons Wellington.—Commercial Herald.

Bituminous.

There is nothing new to report in the business of this article, which is in quiet demand and weak in price.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative statement for the week ending Jan. 24th, and years from January 1st:

Tons of 2240 LBS.	1880.		1879.	
	Week.	Year.	Week.	Year.
Wyoming Region.				
D. & H. Canal Co.	69,983	228,241	51,101	147,828
D. L. & W. RR. Co.	64,166	215,744	58,651	185,886
Penn. Coal Co.	9,599	36,218	19,192	51,439
L. V. RR. Co.	36,374	75,115	16,706	45,173
P. & N. Y. RR. Co.	62	994	637	1,134
C. RR. of N. J.	34,001	104,758	30,879	48,480
	214,185	661,070	177,166	479,940
Lehigh Region.				
L. V. RR. Co.	55,822	155,306	51,238	118,099
C. RR. of N. J.	44,470	112,143	36,370	83,190
D. H. & W. B. RR.				964
	100,292	267,449	87,638	202,253
Schuylkill Region.				
P. & R. RR. Co.	92,678	299,070	105,654	316,318
Shamokin & Lykens Val.	9,288	26,272		21,279
	101,966	325,342	105,654	337,597
Sullivan Region.				
St. Line & Sul. RR. Co.	937	2,198	1,248	3,913
Total	417,380	1,256,053	371,706	1,023,703
Increase	45,674	232,350		
Decrease				

Total same time in 1875..... 538,403 tons
 " " " " 1876..... 957,737 "
 " " " " 1877..... 939,470 "
 " " " " 1878..... 957,989 "
 " " " " 1879..... 1,023,703 "

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

Belvidere Delaware Railroad Report for the week, and years ending Jan. 24th:

	Week.	Year. 1880.	Year. 1879.
Coal for shipment at Coal Port (Trenton)			
Coal for shipment at South Amboy	12,544	26,788	13,858
Coal for distribution	9,330	24,131	16,677
Coal for Company's use	2,104	7,014	5,753

The increase in shipments of Cumberland Coal over the Cumberland Branch and Cumberland and Pennsylvania railroads amounts to 60,778 tons, as compared with the corresponding period in 1879.

The Production of Bituminous Coal for the week ending Jan. 24th was as follows:

Tons of 2000 lbs., unless otherwise designated.	Week.	Year.
Cumberland Region, Md.	30,195	108,486
Barclay Region, Pa.		
Barclay RR., tons of 2,240 lbs.	9,095	31,681
Broad Top Region, Pa.		
Huntingdon & Broad Top RR.	1,247	9,861
*East Broad Top		
Clearfield Region, Pa.		
*Snow Shoe	1,193	
*Tyrone and Clearfield	35,874	
Alleghany Region, Pa.		
*Pennsylvania RR.	5,550	
Pittsburg Region, Pa.		
*West Penn RR.	3,843	
*Southwest Penn. RR.	767	
*Penn & Westmoreland gas coal, Pa. RR.	6,007	
*Pennsylvania RR.	11,104	
*For the week ending Jan. 7th.		

The Production of Coke for the week ending Jan. 7th:

Tons of 2000 lbs.	Week.	Year.
Penn. R. R. (Alleghany Region)	1,064	
West Penn. RR.	1,250	
Southwest Penn. RR.	13,856	
Penn. & Westmoreland Region, Pa. RR.	1,832	
Pittsburg, Penn. RR.	12,662	
Total	29,664	

Wholesale Prices of Bituminous Coal.

DOMESTIC GAS COALS.	At the Shipping Ports, New York.	Along-side at New York.
Per ton of 2240 lbs.		
Westmoreland and Penn. At Greenwich, Philadelphia	\$4.25	\$5.50
At S. Amboy		5.50
Kanawha at Richmond	4.10	5.40
Murphy Run, West Va., at Baltimore	3.75	5.85
Fairmount, West Va., " "	3.75	5.70
Newburg Orrel, Md., " "	3.75	6.00
Cannelton & Peytona Cannel, West Va.	10.00	10.00
" Splint at Richmond	6.00	7.00
" Gas Coal at Richmond	4.00	5.65

MANUFACTURING AND STEAM COALS.

Cumberland at G'n & Alexandria	.....
Cumberland, at Baltimore	.....	*3.25
Cl'r'd "Eureka" and "Franklin"	.....
At mines	.....	1.25
At Baltimore	.....	3.25
At Philadelphia	.....	3.50
At South Amboy	.....	4.85

* F. o. b.

FOREIGN GAS COALS.

	Sterling.	Am. cur'ncy
Newcastle at Newcastle-on-Tyne	7s.6d.	\$2 50@ \$3.50
Liv. House Orrel, at Liv.	25s.	13.00
Ince Hall Cannel	35s.6d.	18.00
" Gas Cannel	25s.6d.	10 00@ 10.50
Scotch Gas Cannel, at Glasgow, nominal	.....	7.50
	25s.	Gold.
		7.50
Bl'k House, at Cow Bay, N.S. Caledonia, at Pt. Caledonia.	\$1.60	\$4.25
Glance Bay at Glance Bay	1.50	4.00
Lingan, at Lingan Bay	1.50	4.00
Intern'l Mines, at Sydney	1.60	4.00
Pictou, Vale Mines, at Pictou	2.00	4.70

Retail Prices.

Per ton of 2000 lbs. Anthracite.

	G. & Egg.	Stove.	Chest.
Fittston coal delivered	\$4.25	\$4.25	\$4.25
Lack. coal, delivered below 59th St.	4.50	4.75	4.50

Wholesale Prices of Anthracite Coal Delivery F. o. b. at Tide Water Shipping Ports, per ton of 2240 lbs.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
WYOMING COAL.						
* Pittston at Newburg	3 20	3 10	3 10	3 10	3 50	3 50
Scranton at Hoboken	3 40	3 40	3 40	3 45	4 00	3 75
Lackawanna at Weehawk'n	3 15	3 15	3 15	3 20	3 75	3 60
Wilkes-Barre at Pt. Johnson	3 15	3 15	3 20	3 20	3 75	3 50
Plymouth R. A. at P. John.	3 15	3 30	3 30	3 30	3 90	3 60
LEHIGH COAL.						
Honey Brook at Port John.	4 00	3 60	3 60	4 00	3 75	
Cross Creek at Port John.	3 50	3 50	3 25	3 25	3 75	3 50
Up. L. & Coun. R. at Eliz'pt	4 00	3 60	3 60	4 00	3 75	
SCHUYLKILL COAL.						
Alongside at N. Y. Harbor.	4 00	4 00	3 85	3 95	4 30	4 00
Hard White Ash			3 70	3 75	4 30	4 00
Free-Burning White Ash			4 25	4 65	4 15	
Schuylkill Red Ash			4 75	4 75	4 15	
Shamokin			4 85	4 85	4 25	
Lorberry			5 75	5 75	5 75	4 75
Lykens Valley (Brookside).			5 75	5 75	5 75	5 00
At Elizabethport.			4 25	4 25	3 95	4 25
Hard White Ash			3 75	3 80	4 25	3 75
Free-Burning White Ash			4 35	4 75	3 85	
Schuylkill Red Ash			4 35	4 50	3 75	
Shamokin			4 75	4 75	4 75	
Lorberry			4 75	4 75	4 75	
Lykens Valley (Brookside).			5 75	5 75	5 75	5 00
At Port Richmond, Philadelphia, for shipment to points beyond capes of the Delaware.			3 65	3 65	3 35	3 35
Hard White Ash			3 15	3 20	3 75	3 25
Free-Burning White Ash			3 75	4 00	3 25	
Schuylkill Red Ash			4 00	4 00	3 25	
Shamokin			4 00	4 00	3 25	
Lorberry			4 75	4 75	4 25	
Lykens Valley (Brookside).			4 75	4 75	4 25	

* Fifty cents per ton additional for delivery at New York.
 † On coal delivered f. o. b. at shipping wharf at Williamsburg, the current rate of harbor freight will be allowed from above prices.

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DIVIDENDS.

OFFICE OF THE CENTRAL MINING COMPANY, 76 Wall street,

New York, Jan. 20, 1880.

NOTICE.—A dividend of five dollars per share, on the capital stock of this company, \$100,000, will be payable at this office on Wednesday, February 4th, 1880, to stockholders of record at the close of business, January 24th, 1880.

The transfer-books will close on the evening of the 24th of January, and reopen on the morning of the 4th of February, 1880.

By order of the Directors,

JOHN STANTON, JR., Treasurer.

OFFICE OF THE EXCELSIOR WATER AND MINING COMPANY,

No. 31 Broad Street, New York, Jan. 26, 1880.

DIVIDEND NO. 23.

The Excelsior Water and Mining Company will pay a dividend of TWENTY-FIVE CENTS per share at the office of Wells, Fargo & Co., 65 Broadway, on February 5th, 1880. The transfer-books will close on the 31st inst.

H. B. PARSONS, Assistant Secretary.

OFFICE STORMONT SILVER MINING COMPANY, 11 Great Jones street, New York.

The Board of Trustees of this company have this day (January 22d, 1880) declared their first quarterly dividend of THREE PER CENT (30 cents a share) on the par value of their stock (\$10) payable at the National Broadway Bank, on February 15th, 1880.

Transfer-books close February 1st and reopen on February 17th, 1880. WILLIAM W. JOHNSON, Secretary.

LITTLE PITTSBURG CONSOLIDATED MINING COMPANY, 113 and 115 Broadway, New York, Jan. 22, 1880.

DIVIDEND NO. 9.

THE BOARD OF DIRECTORS OF THE LITTLE PITTSBURG CONSOLIDATED MINING COMPANY have this day declared their ninth regular dividend of \$100,000 (one hundred thousand dollars), being 50 cents per share (par value \$100) on the capital stock of the company out of the net earnings for the month of January, 1880, payable at the office of the company on and after February 2d. Transfer-books will close January 24th and reopen February 5th. GEO. C. LYMAN, Secretary.

CHRYSOLITE SILVER MINING COMPANY,

Rooms Nos. 51 to 57 BOREEL BUILDING, No. 115 BROADWAY, New York, Jan. 15, 1880.

The Board of Trustees have this day declared a monthly dividend (No. 3) of TWO PER CENT on the ten million dollars (\$10,000,000) capital stock of this company, amounting to two hundred thousand dollars (\$200,000), or one dollar (\$1) per share, out of the third month's net earnings, payable at the Central Trust Company, on the 26th inst.

Transfer-books will close January 22d and reopen January 27th. DRAKE DE KAY, Secretary.

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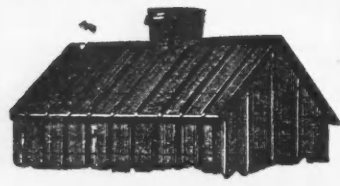
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