

ENGINEERING and MINING JOURNAL.

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CONTENTS.

EDITORIALS :	PAGE.		PAGE.
Edison's Electric Light.....	23	PROGRESS IN SCIENCE AND THE ARTS :	
The Dephosphorization Question....	23	Artificial Production of Diamonds....	31
Colorado's Production of Precious Metals in 1879.....	23	Oxidation of Iron and Steel when in Contact.....	31
Magnetic Prospecting.....	24	Technical Notes.....	31
The United States Mining Investment Company.....	24	The Tay Bridge.....	31
The Cumberland (Md.) Coal Production.....	25	African Projects.....	31
The Silver Reef District, Southern Utah.....	25	A Schol of Mechanical Handiwork..	31
New Publications.....	26	Engineering Notes.....	31
Review of the Iron Trade of the United States for 1879.....	26	GENERAL MINING NEWS :	
Utah's Mineral Product in 1879.....	29	Colorado.....	31
Wells, Fargo & Co.'s Report of the Precious Metal Production for 1879.....	29	Nevada.....	32
The Dial Compass in Topographical and Geological Reconnaissance and Prospecting.....	29	NEW PATENTS.....	32
Ohio Iron and Coal Trade.....	30	PROPOSALS.....	32
Ore Prices of the Boston & Colorado Smelting Company.....	30	FINANCIAL :	
The Labor Question.....	30	Gold and Silver Stocks.....	33
Imports of Coal at Toronto.....	30	Coal Stocks.....	35
The Hudson River Tunnel.....	30	Copper Stocks.....	35
		Gas Stocks.....	36
		BULLION MARKET.....	36
		METALS.....	37
		IRON MARKET REVIEW.....	38
		THE COAL TRADE REVIEW.....	38
		STATISTICS OF COAL PRODUCTION.....	39
		Miscellaneous Stocks and Quotations..	39
		FREIGHTS.....	39

PROF. JOHN A. CHURCH has gone to California. His address will be Baldwin's Hotel, San Francisco, until February 5th.

THE Index of Vol. XXVIII. of the ENGINEERING AND MINING JOURNAL was issued last week.

MR. M. D. CONVERSE, who, for two years past, has acted as Business Manager of the ENGINEERING AND MINING JOURNAL, has retired from that position and from the service of the Scientific Publishing Company. Mr. CONVERSE takes with him the warmest good wishes and thanks of the proprietors of the JOURNAL for the devotion, untiring industry, and faithfulness he has always shown in the discharge of his duties.

EDISON'S ELECTRIC LIGHT.

We have been taken to task by several esteemed correspondents for our too sanguine view of Mr. EDISON'S achievements in perfecting the electric light. We then qualified our statement of "apparent success" by the reported value of Edison Electric Light stock. This week, we hear the stock quoted at \$1500 a share, and so rapid a decline would appear to indicate a collapse of some of the claims put forth for the "invention." In order to give our readers and the public some reliable information on the subject, we applied to Mr. EDISON himself for some data in support of his assertion that his electric light is cheaper than gas illumination, and we record the following reply from Mr. EDISON: "I wanted to publish the data you refer to, but the Electric Light Company object to it. I may say that I can deliver 8 lights net in a house for each indicated horse-power of engine." Since the stock of the company is being bought and sold by the public, we greatly regret the action of the company in withholding information which every stockholder is entitled to, and without which no prudent man should invest in it. Moreover, the objection to giving figures of cost strengthens the position of those who insinuate, if they do not openly assert, that the whole excitement about Mr. EDISON'S invention was merely for stock-jobbing purposes, partly to bull Electric Light stock and partly to bear gas stocks. This would indicate a very unfortunate outcome after so great a labor, and for Mr. EDISON'S reputation, as well as for the good of the cause of electric lighting, we trust it is unfounded. Mr. EDISON is certainly a very ingenious gentleman, and, while we are not able in the absence of any useful data to say that he has solved any of the great well-known difficulties which have hitherto prevented the realization of cheap electric lighting in small lamps, he has, probably, made some important improvements in the details of the plant used for this purpose.

The statement that each horse-power will give 8 lights, each equal, ac-

ording to appearance of the lights now at Menlo Park, to a four-foot gas jet, is not definite enough to analyze and not favorable enough to be absolutely impossible. The difficulties in the way of subdividing the light, and the great loss of power involved in this, do not yet appear to be solved. When they are, we believe that the secret of cheap electric lighting will be found in the use of cheap water-gas burned in small gas-engines in each house, and generating the electricity by means of dynamo-electric machines, for the illumination of one or two houses only. In this way, the loss occasioned by the transmission of electricity to great distances will be avoided, and the little gas-engines can be used for a variety of useful purposes, as well as for electric lighting. It seems also probable that the SAWYER-MANN carbon candle, inclosed in an atmosphere of nitrogen, will be less liable to accident and interruption than the EDISON "carbon horseshoe" in a vacuum.

Till it may please the Electric Light Company to furnish a trustworthy, disinterested expert report upon the efficiency and economy of the EDISON light, we would give the same advice that we have so often offered in the case of mining property offered here without the report of experts as to its value: "Wait till the data is furnished, and keep your money till you know what you are getting for it." At the same time, we have a firm faith in the ultimate economic success of the electric light for general use, and we have also a very high opinion of Mr. EDISON'S ingenuity.

THE DEPHOSPHORIZATION QUESTION.

The latest news from abroad concerning the SNEIUS-THOMAS process for dephosphorizing pig-iron is contained in the proceedings of the meeting of the German *Technischen Vereins für Eisenhüttenwesen* (Technical Society of Iron Metallurgy), held at Düsseldorf on the 13th of December. The first paper read at this meeting was one by Mr. MASSENEZ, general director of the Hörde works, on the subject of the new process, which has already been put in operation at those works. It contains an admirably full and thorough account of the theory and practice of the process, from which we take at present but a few striking points.

"Our operations at Hörde," says Mr. MASSENEZ, "which began September 22d, quickly showed us that the process would be the better carried out, the smaller, to a certain limit, was the proportion of silicon in the pig. Our systematic experiments on this point fully confirm our suspicion that in the THOMAS process the silicon of the pig can be with great success replaced with phosphorus, and that this does not at all prevent the attainment of a temperature in the steel high enough to permit casting from the bottom. * * * We can without any difficulty transform ordinary white pig-iron, containing silicon less than 0.5 per cent, of carbon, 2.5 per cent, and of phosphorus, over 2 per cent, into steel or ingot iron containing 0.03 per cent, or less, of phosphorus."

"The expenses of the process will not, in regular practice, greatly exceed those of the ordinary Bessemer method. They consist essentially in the cost of the lime, which is about 1.5 to 1.8 marks for 1000 kilos of ingots, and the extra expense for refractory lining-material, which may be estimated at 1 to 1.5 marks. The smaller production I do not take into account, since it can be compensated by the use of larger apparatus. On the other hand, the consumption of blast, and hence of fuel for making blast, is smaller than in the ordinary Bessemer practice, by reason of the reduced duration of the blows. The above extra cost of 2.5 to 3 marks is to be compared with the difference in price between ordinary pig-iron and 'Bessemer pig.'"

Mr. MASSENEZ stated the difference between these varieties to be, for 1000 kilos of steel ingots, at least 27 marks. A mark is about 24 cents of our money; and 1000 kilos (2204 lbs. av.) is not far from a gross ton. To the items of cost given by him, is to be added the patent fee. But it is evident that a wide margin of profit still remains. *

COLORADO'S PRODUCTION OF PRECIOUS METALS IN 1879.

MR. FRANK FOSSETT, the author of "Colorado," who has just returned from that State for the purpose of revising and publishing another edition of his valuable work, expresses himself as follows on Colorado's production of precious metals:

"Colorado, which at one time was far in the rear among the mining sections of the country, and which gradually advanced to the third place, has taken an immense stride forward during the past year, and has distanced California in the production of the precious metals. Next year, she will surpass Nevada and all other mining regions in the field of gold and silver. While correct detailed statements have not yet been obtained from all quarters, enough is known to assure a return of \$18,650,000 for Colorado for the year 1879, while the present rate of production is over \$2,000,000 per month, with a prospect of a steady increase hereafter. The enormous gain will be appreciated when the fact is stated that the yield of 1878 was but little over \$10,000,000; that of 1877, \$7,216,283; that of 1876, \$6,191,907; and that of 1875, \$5,434,387. Of the product of last year, \$14,100,000 was silver, \$3,000,000 gold, \$1,450,000 lead, and \$125,000 was copper. Below will be fou

close estimates of the production of counties and sections for the year 1879:

Lake (Leadville).....	\$11,400,000	Park.....	\$506,000
Gilpin (Central).....	2,500,000	Custer.....	300,000
Clear Creek (Georgetown).....	2,000,000	Summit.....	317,000
Boulder.....	742,000	The San Juan Region.....	485,000
Other sections.....			\$400,000

"Clear Creek and Custer shipped less ore and bullion than in the year preceding. This was due to the stoppage of shipments from several prominent mines recently sold to Eastern companies, which have since been engaged in development and preparations for future production. The Freeland, Dunderberg, and Boulder Nest groups of mines, in Clear Creek County, were examples of this kind. Their combined product for 1880 is likely to reach a round million. The same is probably true of several mines in the Silver Cliff and Rosita districts of Custer County. It will be noticed that the old and reliable gold district of Gilpin County, or Central City, has made a handsome gain, which will be still further increased hereafter. Leadville's production has increased from \$3,152,925 in 1878 to over \$11,000,000 in 1879. There is every reason to expect that Colorado's total output for 1880 will range from twenty-five to thirty millions."

MAGNETIC PROSPECTING.

We publish, in another column, an interesting letter from Prof. BROOKS on the subject of the dial compass. We have not the necessary time to collect, as Prof. BROOKS suggests, a list of recent publications in Swedish and German on this subject; but we will state for the benefit of our readers the substance of the method of Prof. THALÉN, to which our correspondent refers. It is to be found in the proceedings of the Swedish Academy of Sciences for 1874.

This method consists in determining, at a great number of points in the field which is to be examined for magnetic iron ore, the resultant between the horizontal components of terrestrial magnetism and of the local attraction. With the aid of these determinations, isodynamic curves are drawn, from the form and nature of which the position and importance of the ore-body may be inferred. The magnetometer used in this work consists, in the first place, of the ordinary compass, graduated to degrees. From the compass-box extends a horizontal arm, upon which the fixed magnet required for the determination of the deviation can be so laid that its distance from the movable needle remains unaltered. Besides this, the instrument possesses a leveling apparatus and a "diopter," with a set-screw, which can be fastened to the horizontal arm. In using the instrument, the compass-needle is first brought to zero, while the deviation magnet is removed from its place; the latter is then restored to its place, and the angle of deviation is read. In order to obtain exact indications, very many such observations must be made. For this purpose, the field is divided into squares of 30 meters, in each corner of which the measurements of intensity are taken. It is then easy to decide whether further observations between these points are necessary.

When these measurements have been noted on the map, it is only necessary to connect the points having equal angles of deviation. The isodynamic curves thus obtained are generally, in the field belonging to one ore-body, closed curves, and group themselves around two special points, one of which, lying north of the ore, is distinguished by the maximum angle of deviation, while the southern point presents the minimum angle. The former represents the smallest intensity, and the latter the greatest. Under the line connecting the two points, which THALÉN calls the magnetic meridian of the ore-field, the most important part of the ore-body is in general to be sought. A line called the neutral line, which is not a closed curve, may be drawn between the two groups of isodynamic curves, and indicates the points where the magnetic influence of the ore is zero. The point where this line intersects the magnetic meridian of the ore is said to be the best spot for beginning mining operations, since it is presumably over the middle of the important mass of ore. Where the covering of soil or rock is very deep, it is, of course, advisable to assist these determinations by means of boring.

Prof. THALÉN says that the distance of the point of intersection, just referred to, from the magnetic meridian of the point of minimum deviation, bears a certain simple relation to the distance of the center of the ore-body from the surface, provided the ore lies at considerable depth. This condition is also a necessary qualification of the preceding statement concerning the location of the middle of the ore-body.

Prof. THALÉN's reasoning is, in substance, as follows: The ore owes its magnetism to the inductive effect of terrestrial magnetism, and will, therefore, act like a magnet in free suspension, but with the South pole down and the North pole up. On the northern side of the ore-body, the magnetism of the ore partly counteracts that of the earth, and the deviation caused by a fixed magnet is, therefore, a maximum. On the south side, the two influences act together and the deviation is a minimum. The principal axis of the ore-body coincides, therefore, with the line connecting the points of maximum and minimum deviation. If the ore is very near the surface, the point of greatest abundance of ore will fall at

the point of minimum deviation instead of the intersecting above described; but in this case the attraction will be so strong, upon a dip-needle, for instance, as to leave no room for error.

The calculations by which Prof. THALÉN supports his statements of the relation between surface observations and the depth of the ore-deposit, we will not here repeat. The results of these calculations have been tested upon mines already opened and more or less known as to position and extent. They are said to have agreed very well with the facts. But much, doubtless, remains to be done before a precise and unerring distinction can be drawn between effects of ore near the surface and ore removed from it, if, indeed, this can ever be accomplished. Moreover, the magnetism, even of distinctly magnetic iron ores, is not in proportion to their richness, although it is probable that within the limits of a single deposit, and apart from the oxidized portions of it, this proportion may obtain. On the whole, the uncertainty is so great as to warrant Prof. BROOKS's strong assertion, that he has found in all magnetic iron ore regions fifty "attractions," more or less strong, to one workable ore-deposit. *

THE UNITED STATES MINING INVESTMENT COMPANY.

The United States Mining Investment Company is the name of an organization which includes among its directors many of our most prominent and wealthy citizens. The object of the company, in the language of its circular, is "to investigate, by the best engineering talent, employed *specially* in the interest of this company, the real merits and value of mining properties;" or, as again stated, "This company has been formed for buying and selling dividend mines."

An organization based upon these principles, and carried on in accordance with them, will not only afford investors in mines an assurance that the properties offered them are such as represented, but it will act as a powerful advocate and upholder of honest management and legitimate mining; and, in this sense, we welcome it as a potent ally in the cause which the ENGINEERING AND MINING JOURNAL has always made its own.

"Wild-cats," and worthless property, can not be foisted on the public, when full examination and investigation, both of titles and value, by disinterested experts, of recognized standing and ability, are insisted on before payments are made, and this is precisely what the United States Mining Investment Company proposes to do. Having abundant capital for the most efficient execution of its plans, it will not limit its investigations of the value of property, which it proposes to offer to the public, to an expert, but will have the examinations made independently by several engineers selected from among those in the front rank of the profession, and who command the confidence of both experts and the general public. It can safely be assumed that no unworthy property can pass such an ordeal, and that what receives the indorsement of the experts employed by the company, and the business guarantee, so to speak, of the following board of directors, will, so far as its intrinsic value is concerned, be what is claimed for it. Titles will be investigated in the same careful manner, and those interested in property offered under these auspices should not only get mines of substantial value, but they have good assurance of actually owning the property which they have bought, which, unfortunately, is not always the case.

The effect of such an organization, prudently managed, as an educator of the public, and as the champion of legitimate mining, can scarcely be overestimated. By its very influence, and by the investigations and expert testimony the well-known capitalists who form the board of directors announce as an absolutely essential preliminary before property can be offered to the public, it should certainly act as a most convincing lesson, not only to those simpletons who invest their money upon the interested statements of vendors or non-experts, but to the unblushing impudence that is offering here to-day, at the value of good mines, innumerable "prospects" wholly undeveloped and with no expert testimony as to their value or to the validity of their title. The United States Mining Investment Company will help the ENGINEERING AND MINING JOURNAL to teach people that stocks offered to the general public here in the East should be based upon real value in the mines and sound titles, both certified to by competent and disinterested experts. When the public learns this lesson, mining will become as legitimate a business as any other, and it will be much more profitable, while the promoters of wild-cats will return to the Pacific coast, where they have so long found a congenial and hospitable home.

Great credit is due to Mr. DORSEY, President of the United States Mining Investment Company, for his clear appreciation of the requirements of the Eastern mining market, and for having secured a board of directors whose names are household words in our best financial circles. The only danger to the public that we can now see is, that such a board of directors, commanding unlimited capital, may be inclined to sell to the public only at all a property is worth, or, perhaps, in some cases a shade more than this. This is no imaginary danger; but, besides unlimited capital, this directory represents the highest business ability—two things by no means inseparable—and it is only necessary to remind them that nothing is easier than to overvalue a good mine; and

if the public finds investments made through the U. S. M. I. Co. unprofitable, though safe, it will leave them alone. The company has the ability to buy mines cheaper than individuals usually can, and it should sell them also at figures which will attract the capital now seeking extra-hazardous investments, in the hopes, usually disappointed, of large profits. Though, probably, our word of warning is quite unnecessary, with a board comprising so much practical business ability, and with a president who has the additional advantage of extensive practical expert experience in the operations of mining, and who is, therefore, thoroughly familiar with every phase of the question.

The following is the formidable list of the officers and directors of the company :

President, Edward Bates Dorsey. Vice-Presidents : Henry Havemeyer, James D. Fish, William H. Guion, A. Foster Higgins, Arthur F. Willmarth. Secretary, S. A. Wheelwright; Treasurer: H. B. Laidlaw, of Laidlaw & Co. Directors: Edward Bates Dorsey, Mining Engineer; I. C. Babcock, Treasurer Adams Express Company; William H. Guion, of Williams & Guion Steamships; William Pitt Shearman, late Treasurer and Receiver Erie R. R.; Charles M. Fry, President National Bank of New York; Jonathan Odell, banker; D. S. Appleton, of D. Appleton & Company, publishers; Ulysses S. Grant, Jr., lawyer; Arthur B. Graves, President St. Nicholas National Bank; George W. Warren, N. Y. Life Insurance Company, Boston, Mass.; Edward A. Flint, Consulting Engineer, Boston, Mass.; C. A. Whittier, of Lee, Higginson & Co., Boston, Mass.; James D. Fish, President Marine National Bank, N. Y.; H. Havemeyer, of Havemeyer, Eastwick & Co., refiners, N. Y.; A. F. Willmarth, Vice-President Home Fire Insurance Company, N. Y.; William L. Jenkins, Jr., of W. S. Nichols & Co., bankers, N. Y.; George B. West, commission merchant, N. Y.; Thomas Manning, broker, N. Y.; Henry W. Ford, President National Bank of Republic, N. Y.; A. Foster Higgins, U. S. "Lloyds" Marine Insurance, N. Y.; Charles L. Perkins, of Perkins, Livingston & Co., bankers, N. Y.; L. B. Greenleaf, of Tower, Giddings & Co., bankers, Boston, Mass.; J. Baker, Vice-President St. Louis & St. Francisco RR., St. Louis, Mo.; Arthur Sewall, President Bath National Bank, Maine; James P. Robinson, Consulting Engineer, New York. BOSTON BRANCH: Edward A. Flint, Agent, Tremont Bank Building.

THE CUMBERLAND (MD.) COAL PRODUCTION.

NAME OF COMPANY.	1876.		1877.		1878.		1879.	
	Tons. cwt.		Tons. cwt.		Tons. cwt.		Tons. cwt.	
Borden.....	143,147	7	97,860	2	120,047	9	154,973	19
Consolidation.....	342,198	11	334,107	5	390,097	18	470,196	1
Blaen Avon.....	43,228	9	33,701	00	28,304	2	40,856	19
Hampshire & Baltimore.....	92,045	9	90,777	3	17,878	7	105,778	8
George's Creek Coal and Iron Co.....	197,063	19	121,302	15	87,110	3	128,932	13
New Central.....	240,269	4	345,542	6	351,677	14	332,739	9
Maryland.....	76,237	3	119,000	1	119,400	16	68,270	11
American.....	127,758	18	117,655	8	105,468	18	98,574	7
Atlantic & George's Creek Co.....	146,097	8	92,482	8	79,377	19	66,896	00
Piedmont.....	35,983	19	35,284	15	23,312	3	15,475	18
Swanton.....	63,862	15	48,800	00	37,335	00	41,579	00
Potomac.....	58,120	10	63,229	5	55,956	00	75,807	00
George's Creek Mining Co.....	61,884	00	1,724	11	.....	.....	.....	.....
Franklin.....	64,011	13	45,215	12	134,480	19	102,282	19
George's Creek Valley M. Co.....	1,039	3	1,124	8	46	00	.....	.....
Canton Mine.....	.....	.....	1,212	8	10	00	27	6
Union Mining Co.....	.....	.....	1,003	3	128	4	.....	.....
New Reading.....	1,605	10	.....	.....	.....	.....	.....	.....
Virginia.....	102,371	6	.....	.....	.....	.....	.....	.....
North Branch.....	.....	.....	.....	.....	.....	.....	612	2
Total.....	1,800,725	04	1,550,028	10	1,650,631	12	1,702,992	12

In our "Annual Review of the Coal Trade of the United States for 1879," published in our last number, we were compelled to estimate the total production of the Cumberland field, and placed it at 1,700,000 tons. The above are the official figures, and differ less than 3000 tons from our estimate.

THE SILVER REEF DISTRICT, SOUTHERN UTAH.

The silver-bearing sandstones of Southern Utah are, both in a geological and business sense, among the most interesting mineral deposits ever discovered. The Silver Sandstone District is composed of beds of sedimentary sandstone, of the tertiary or cretaceous age, which are similar in all respects, except in silver contents, to the great horizontal beds through which the cañons of the Colorado River of the West are cut. The silver district forms a depression in the great plateau; and is bounded by high vertical cliffs, giving the impression that this district was broken off from the great plain. The beds in it are more or less inclined, and are composed of alternating series of white and yellow, red and purple sandstones and shales, some of which are impregnated irregularly with silver ores, either in the form of chlorides or of sulphides. Near the line of the supposed break between the horizontal bed of the plateau and the declined beds of the silver-bearing district occur a number of volcanic overflows of basalt, which have the appearance of being the result of a single outflow or eruption, and which appear also to be connected with the presence of these mineral deposits in the inclined beds, which all dip toward the fault.

No doubt, the heat and volcanic gases from this lava outburst rendered more energetic the solvent liquids passing through the sedimentary sandstone containing silver. As this silver-bearing solution approached the surface, its temperature and pressure would be reduced, and as the porous sandstone beds through which it filtered contained large quantities of carbonaceous matter, the silver was precipitated in the insoluble form of sulphides, and these were subsequently in part changed to chlorides above the water-level. In this manner, we may suppose the accumulation

of silver ore in these sedimentary sandstone, and shales to have been brought about, and many facts seem to confirm this view of the case.

The accompanying figures, the first showing a cross-section view of the Silver Reef country, and the second a view engraved from a photograph showing the silver-bearing sandstone reefs, give some idea of the formation of the country and of the appearance of the reefs which have given the name to this very important and interesting mining district. As here shown, the reefs represent distinct beds, one overlying the other; but the remarkable similarity in their color and physical characteristics has led many to suppose that these two main reefs are but parts of the same bed, with a fault between the reefs. Certainly this remarkable similarity in the beds is very striking; but the closest examination has failed to afford ground for the common belief in a fault between the reefs, and strengthens the opinion that they are distinct beds, separated by softer beds of argillaceous sandstone or shales. The thickness of the beds which separate the two reefs appears to be about 500 feet. The reefs form a crescent, the White Reef being the outer rim, and the Buckeye, with a break at one point in it, forms the chord of the arc. Toward each extremity of the crescent, these two reefs approach each other quite closely, while in the center they are separated by perhaps a mile, as is shown upon the accompanying map. The silver-bearing beds, which have been worked, outcropped in both of these reefs, and have been found of nearly equal richness in the principal mines on each. Among the most important of these mines, and those which are the most largely developed, are the Stormont, Buckeye, and Californian claims, on the Buckeye Reef; and the Thompson & McNally claims upon the White Reef; all forming parts of the property of the Stormont Silver Mining Company. Other claims in the district are also shown upon the accompanying map, and some of these, such as the California, the Silver Flat, the Barbee & Walker, and others, have been worked to a considerable extent, and have produced large amounts of bullion.

MODE OF OCCURRENCE OF THE SILVER ORE.

The following extracts from a report made during the past summer describe the nature and mode of occurrence of these ores :

"The silver occurs as chloride and sulphide, and occasionally as native silver, disseminated through the more porous and fissured beds, and especially in the bedding and fracture planes of the sandstone, and coating the bright 'slipped' surfaces of the hard shale beds—locally known as soapstone—where these beds have been disturbed and crushed. Wherever the shale is compact and has not been crushed—that is, wherever it remains in a condition in which water could not pass through it—it contains no silver. And wherever the sandstone beds become very hard, compact, and unfissured, they appear to become poorer, and the silver is confined more largely to the bedding planes. The silver, that at some depth below the surface was distributed with more or less uniformity throughout the ore-bearing bed, appears to collect in the planes between the beds as these approach the outcrop, giving the appearance of the silver 'vein,' so-called, having split up and come to the surface as thin leaders or stringers of very rich ore. This is not only the well-recognized condition of the silver-bearing beds everywhere near their outcrop, but it is the condition we should naturally expect from the mineral-bearing solution collecting in the bedding planes, as these offered more available channels near the surface.

"It is quite evident that the silver we now find coating the polished surfaces of the crushed shales, and filling the cracks and coating the surfaces of the fossilized (petrified) wood frequently found in the sandstone beds, must have come there after these substances had assumed their present conditions. We may, therefore, expect to find in future, as has been found thus far, that the conditions which facilitate the percolation of the silver-bearing solution, where the rocks contained suitable precipitants, will favor the occurrence of ore, and the rocks becoming compact, hard, and unbroken—conditions which would naturally impede the percolation of water—will be found unfavorable to the occurrence of rich ore-bodies.

"The occurrence of ore in these sandstone beds is extremely capricious, as might be expected from the method of deposition suggested. It occurs in numerous chimneys or chutes, and has collected in portions of the beds where ferruginous or carbonaceous matter appears to have attracted it; yet copper, which, in many places, stains the rocks green, seems, on the contrary, to be an unfavorable indication for silver.

"These ore-chimneys are sometimes small, and at other times they are several hundred feet in horizontal length in the bed. The ore at their limits—sometimes suddenly, sometimes gradually—disappears, while the sandstone bed frequently continues apparently undisturbed; in the former case, it is generally noticed that the bed is crossed by a fissure, and it has sometimes been found that the ore, which, up to the fissure, impregnated one division of the bed, will pass up or down and continue beyond it in another part of the bed, or will pass completely into another bed. Consequently, it is necessary to 'cross-cut' quite frequently in prospecting, in order to ascertain whether the ore which has disappeared from one bed may not be found in a neighboring one which at another point may have been quite barren.

"The silver, though occurring chiefly in a few easily-recognized beds in each reef, is by no means confined to these; in some of the mines it is found in paying quantities in only one; in other places in two, three, or four beds, while several of the other seams of sandstone contain small quantities or traces of the metal; and in those which, in certain divisions, carry paying quantities of silver, the balance of the bed too poor to be milled contains rich nodules and pockets of ore, and is broken up and sorted in the mines, producing an important part of the ore milled. It, therefore, happens that, while the dimensions of the rich portions of the bed may be small, perhaps one, two, or three feet, yet as much as five or six feet of intermediate or overlying poorer rock will contain sufficient rich ore in these nodules to make it profitable to break it down and sort it. This feature is observed in all the mines of the camp, and necessitates the exercise of judgment, guided by frequent assays, to estimate fairly the yield of ore in the reserves. It is evident that a sample taken over the entire thickness of rock which it pays to take down would give an assay so low as to make it appear worthless; yet perhaps one third of the bed would give a high-grade ore, and the remaining two thirds, yielding extremely rich ore in small iron-stained nodules and in plant impressions (which would be avoided in taking a sample), though apparently of little value, will, in reality, yield nearly as much silver as the one third from which we obtained a good assay.

"In the Last Chance mine, and also in the Buckeye mine, are places where it pays to mine out the bed to the height of ten to fourteen feet; yet a sample of this entire thickness would give so low a return that the whole bed would be

rejected. Nevertheless, by the exercise of skill in sorting the ore, a large amount of good ore is obtained from portions of the bed which, according to the sample, would be worthless. Indeed, for this reason it is found that the sample assays in all of these mines run much below the actual mill returns from the same ore.

For the reasons already stated, the ore-chimneys seem almost as capricious in their vertical as in their horizontal dimensions. Nevertheless, where exploration has been continued, either in depth or horizontally, other chutes or chimneys have generally been found within a short distance. As none of the mines have exceeded a few hundred feet in vertical depth (the deepest mine in the district extends 600 or 800 feet on the bed from the outcrop to the deepest point opened—a vertical depth below the surface of perhaps 200 feet), the question of the continuation or recurrence of ore-bodies at a great depth is an open one, no data sufficient to base an authoritative opinion on having yet been afforded, though the past experience seems to prove that no depth yet attained has exercised any injurious influence upon the richness of the ore.

The great number of ore-bodies already found in the insignificant depth and lateral extent explored affords the strongest ground for believing that these sedimentary beds, though by no means carrying pay-ore throughout, will be found to contain, even without counting to any great depth, vast quantities of ore similar in quality to that they have already yielded.

The work already done on the silver-bearing reefs has fully demonstrated that the ore is more abundant and richer at certain points than at others, and a most careful examination of each particular property is necessary to determine its value; for while the rocks which contain the ore are as continuous as other sedimentary beds, the occurrence of pay in them appears to be subject to the same laws, conditions, and accidents which have governed the deposition of similar ores in fissure-veins.

Before entering upon a description of the special features in each mine, and the figures of cost, both of mining and milling, at the several properties in this camp, we shall summarize the production since its first mill was built in February, 1877:

BULLION PRODUCTION OF SILVER REEF, UTAH.
(In ounces of fine silver.)

	1877.	1878.	1879.
	Ounces.	Ounces.	Ounces.
January.....	18,427.47	55,174.65	62,666.13
February.....	31,094.55	56,775.80	84,394.09
March.....	23,070.15	86,872.05	85,441.56
April.....	50,743.06	76,897.17	88,888.01
May.....	32,513.65	82,209.11	83,163.43
June.....	28,218.00	81,168.91	74,935.95
July.....	34,703.77	71,401.58	67,878.10
August.....	48,686.86	73,030.69	62,031.09
September.....	56,385.31	67,117.50	58,873.77
October.....	45,850.45	79,047.64	63,239.22
November.....	31,473.91	67,528.10	69,449.31
December.....		86,167.20	65,741.64
Totals.....	371,777.88	883,990.40	866,702.33
Grand total 2,122,470.61 ounces, at \$1.15 = \$2,410,841.10.			

In the above statement, we take the production from July to the close of the year, December being estimated, from the *Silver Reef Miner* of December 20th, 1879.

We shall next week begin a detailed description of the Stormont Silver Mining Company's mines and mill, giving also the cost of mining and milling these remarkable ores, and the profits which result from their treatment.

NEW PUBLICATIONS.

REPORT ON A PRELIMINARY INVESTIGATION OF THE PROPERTIES OF COPPER-TIN ALLOYS, Made under the Direction of the Committee on Metallic Alloys, United States Board to Test Iron, Steel, and other Metals. ROBERT H. THURSTON, Chairman in the Mechanical Laboratory of the Stevens Institute of Technology. Washington, 1879. 8vo, 582 pages.

Each successive publication proceeding from the U. S. Test Board deepens our regret that its vast and fruitful labors have been suspended. It would not be possible to gather a body of more competent, faithful, and devoted investigators than the distinguished gentlemen who composed that Board, and who freely gave to its work not only their time and talent, but no little pecuniary sacrifice. Prof. THURSTON, indeed, may be said to have spent his health, and almost his life, in the amazing labors which his zeal has undertaken in this cause. The volume before us is an evidence (and has come near being in the saddest sense a monument) of his industry. It is true that, in the Editor's Preface, he accords hearty and well-deserved credit to Mr. WILLIAM KENT, who may well be proud of such praise from such a source, and to several other assistants, especially to Mr. F. T. THURSTON, who has revised the pages of the report, and, with Mrs. THURSTON, prepared the illustrations. But no one who knows the chief editor will doubt that his hand has been at work to the full extent of human strength throughout the undertaking.

The letter of transmission, signed by Messrs. R. H. THURSTON, L. A. BEARDSLEE, and DAVID SMITH, as the Committee on Metallic Alloys, presents an excellent statement of the scope of this volume. After promising a similar report upon the copper-zinc alloys, and a further report upon the triple alloys of copper, tin, and zinc, the committee remarks of these reports:

"They represent the results of the first complete and systematic researches ever made upon these most important of all the alloys of useful metals. This work has been carefully planned, and the plans formed have been completely carried out. The result has been the complete exploration of a broad and most important field, of which almost nothing was previously known. Ordnance-bronze, bell-metal and speculum metal, a few grades of brass and of the triple alloys, are the only alloys familiar to our founders and engineers.

"The whole field has now been explored; and the useful alloys are proven to occupy but a limited portion of its great extent. It has now been shown that a comparatively narrow band, extending from ordnance-bronze, on the one side of this triangular territory, to Muntz metal, on the other, contains all of the best of the generally useful alloys. This small portion of valuable territory having been pointed out and defined, its more minute study may be left for future investigators."

The tests which form the basis of this report are comprised in two series, the first of 29 and the second of 20 bars of copper-tin alloy, rang-

ing in regular gradations from pure commercial copper, through intermediate mixtures, to pure commercial tin. In the first series, regard was had to the atomic weights of the two metals; but we do not find in the results or their discussion any indication that a chemical union takes place upon the fusion of these metals, unless the variable tendency to separation by liquation be such an indication. There is no definite law of this tendency to be deduced from the tests. Prof. THURSTON says merely that in general there appears to be a greater loss of tin than of copper in the bars which contain the greater percentages of copper, and *vice versa*; and that the bars which contain about equal amounts of the two metals show great tendency to liquation.

The methods and apparatus employed are fully described, and complete particulars of the tests by transverse stress, tensile stress, torsional stress and compression, accompanied with chemical analysis and determinations of specific gravity, are given. The results are graphically exhibited in curves, and the surfaces of fracture are represented by photographs, so that nothing is wanting which can render the data available for future reference and discussion. Moreover, an admirable preliminary discussion of them is furnished by Prof. THURSTON himself, who also adds, in a most valuable appendix, a series of selected papers on metallic alloys, including the papers from his own pen, which have already won so wide a celebrity, and a collection of the researches of CALVERT, JOHNSON, UCHATIUS, REGNAULT, MATTHIESSEN, FORBES, WERTHEIM, RICHE, and many others, which amounts to a complete history of scientific investigation in this department.

The extraordinary spasm of Congressional economy which stopped the operations of the Board seems to have gone so far in its effects as to prevent even the authors of these reports from receiving copies for their own use, much less for distribution. We are happy to say, however, that VAN NOSTRAND has for sale an edition of the report now under consideration (printed, we believe, at the private expense of Prof. THURSTON); and we can assure our readers that nothing in recent technical literature is so well worth purchasing. It is at once indispensable and satisfactory. It fills a gap, and it fills it well. The ground which it covers for the first time is so thoroughly covered that it need not be gone over again; and the possessor of this report may therefore enjoy the pleasure (not common in such cases) of owning a book which the progress of science, however it may complement, will not supersede.

REVIEW OF THE IRON TRADE OF THE UNITED STATES FOR 1879.

The year 1879 was one of the most remarkable ever witnessed, not only by the iron trade of the United States but by the commercial interests as a whole. The year opened with the greatest depression ruling in this branch of industry. Prices were lower than ever before in our history, and the demand was far below what our immense growth seemed to warrant. There were, however, indications of more prosperous times for the iron trade, which we in our review twelve months ago pointed out. Prices have advanced during the year nearly 100 per cent. Production has increased largely over any previous year, and the consumption of pig-iron has been fully 500,000 tons greater than even during the wildest period of railroad construction.

The causes for this sudden transformation are many, and can be traced through all of our industrial arteries. The most substantial aid came, however, from our railroads. Since the panic of 1873, the managers of these have been practicing a system of deception called economy, which in fact was nothing more than reducing expenses at the cost of a depreciation of property. This could not last forever so. In addition to the normal requirements, the iron trade has been compelled to supply the deficiency of the past six years. At the beginning of 1879, our railroad system aggregated about 80,000 miles. It is estimated that the average requirements of iron per mile, including rolling stock, are about 150 tons, and that the average life of railway iron is 10 years. It will, therefore, be observed that the normal requirements of the country for our existing roads are about 1,200,000 tons per annum. In 1879, owing to the vast increase of traffic, the railway companies were forced to make renewals, and the repairs that were neglected since 1873 were, to a large extent, forced into 1879. In addition to this, the development of our mining districts in the far West, and our farming lands east of the Rocky Mountains, gave such a stimulus to railroad construction, that we find the total of new railroads added to our system in 1879 was about 4000 miles, calling for an additional 600,000 tons of iron or steel.

It became evident, early in the season, that the crops of Europe would prove a failure. This created a very active demand for the surplus of our crops of 1878, which was followed by a continued strong demand for our crops of 1879. The conversion of these immense stocks into cash started all the wheels of commerce, which, in conjunction with the handling of the products of our farms, furnished a traffic that could not be met by the rolling-stock and appliances that had more than sufficed in previous years. The result was, that every car and loco-

motive establishment in the country was soon full of orders, and one of the first signs of a scarcity of iron and the inability to supply the demand, even by utilizing all of our productive capacity, was an insufficient supply for the manufacture of car-wheels.

According to Mr. JAMES M. SWANK, Secretary of the American Iron and Steel Association, the production of iron in 1879, as compared with 1878, was as follows :

Articles.	1878.	1879.
<i>Pig-Iron and Old Iron.</i>	Gross tons.	Gross tons.
Production of pig-iron.....	2,301,215	2,800,000
Importation of pig-iron.....	66,503	275,000
Importation of old rails and other old iron.....	5,558	175,000
Total	2,373,276	3,250,000
<i>Rails.</i>		
Production of iron rails.....	288,294	450,000
Production of steel rails.....	499,817	650,000
Importation of iron and steel rails.....	9	60,000
Total	788,120	1,160,000
<i>Iron Ores.</i>		
Lake Superior production.....	1,125,231	1,350,000
Importation.....	31,400	300,000
Total	1,156,631	1,650,000

He says further : " We have not ventured on an estimate of the production of rolled iron in 1879 ; but, excluding iron rails, which are noticed above, it was probably 20 per cent greater than in 1878, when the total production, not including iron rails, was 1,100,612 gross tons," and in 1878, there was a larger production than ever before. It must be borne in mind, also, that we had large stocks of nearly all classes of iron and manufactures thereof on hand at the opening of the year, while at its end they were reduced to a minimum. We are unable to give the stocks of other materials on hand at the beginning of 1879 ; but according to Mr. SWANK, that of pig-iron amounted to 574,865 tons, most of which was consumed along with our immense production. According to the above table, our production of pig-iron reached the immense figure of 2,800,000 gross tons ; while the largest previous production in any year was 2,560,960 gross tons in 1873. Our production of iron and steel rails is estimated to have been 1,100,000 tons, against 892,857 tons in 1872, the largest previous year. Our imports of iron and steel of all kinds have not been officially reported for the whole year ; but they probably amounted to about 500,000 tons, the greater portion of which has gone into consumption. The largest imports were in 1872, amounting to 1,224,144 tons ; but at this time there was a vast amount of speculation, and foreign producers were sending large quantities of iron to this country on consignment, and a very large quantity was carried over to the next year in our yards and stores.

Although the record of both consumption and production in 1879 was without equal in our previous history, yet the prospects for 1880 are very much greater. A traffic previously unsurpassed is promised our railroads, and to meet this it is very probable that our rolling stock manufacturers will be fully engaged during the year, and as most of our roads are better able to make repairs than in 1879, the demand for this purpose is likely to increase. What number of miles of new road will be built, it is difficult to say ; but from the present indications, it will be much greater than in 1879. The estimates are from 7000 to 9000 miles. At all events, the requirements for railroad purposes will probably equal from 2,000,000 to 2,500,000 tons. If so, we shall be compelled to bring in considerable foreign iron. In fact, large quantities have already been ordered.

The construction of elevated railroads in this city greatly stimulated the demand for iron during the past two years, and the prospects are that considerable quantities will be absorbed for the same purpose during 1880 ; but their adoption in other cities does not appear probable, except in Brooklyn and the Pennsylvania Railroad Company's line from West Philadelphia to Fifteenth street, Philadelphia. The starting of all classes of manufacturing establishments, and the general prosperity of the country, will bring with them a proportional increase in the demand for iron for general purposes which it is impossible to trace, but which is clearly indicated by the large demand that has sprung up from all classes of consumers.

The demand for steel rails is likely to be greater in proportion to the production than that of any other article. In fact, the productive capac-

ity of the whole world will not be able to meet the world's requirements. Iron rails can be more largely produced, but it is questionable if the whole demand can be supplied. The production of pig-iron will be somewhat held in check by the scarcity of iron ores, while the consumption of old rails and scrap iron has been so large as to greatly reduce the stocks of these, and to necessitate the use of forge iron for making bar iron, etc. This is already indicated by the extraordinary demand for forge iron, which is one of the most healthy features of the present active demand. The question of what should be done with the old iron rails as they were replaced by steel, appeared to be, a year or two past, a very serious matter ; but the greatly increased demand for re-rolled iron rails and rolled iron has solved this question, and during 1880 all of the old iron rails will probably be required to supply the demand for re-rolled rails, and very likely the manufacture of new iron rails from pig-iron will have to be resorted to again.

Our imports of iron and iron ore will probably be much larger than in 1879.

Our exports show a falling off in nearly every article. This, however, is not surprising under the extraordinary home demand, and with the necessity of calling on foreign countries for the large supplies which we are unable to furnish at home.

The quoted prices of iron were as below.

American Pig-Iron.—This article has shown the most remarkable activity, as well as the greatest advance, of any article of iron during the year under review. The year opened with a very quiet demand, and prices still on the downward course. Early in January, it was announced that the Lehigh Iron Company was in financial trouble, and it was rumored and feared that similar announcements would be made concerning other companies. This naturally encouraged buyers to delay purchases as much as possible in expectation of lower prices for this class of iron. As no other failures were announced, however, there began to be a better inquiry toward the latter end of January, brought about by the actual necessities of consumers ; for purchases still continued to be of a hand-to-mouth character, as they had been for several years previous, buyers expecting lower prices, although, as a rule, they knew that but few makers were even covering the cost at the prices then current for their product. About February 1st, the announcement was made that several thousand tons of No. 2 iron had been sold to the establishments employed in furnishing the iron-work of the elevated railroads of this city, and, at the same time, numerous small lots were reported to have been sold at very low prices. This, however, appeared to be the turning-point ; for immediately after this, there came quite an active demand, and before the end of February we had reported sales of about 75,000 tons, and prices were fully \$1 per ton above the lowest point reached. Consumers, however, still had but little confidence in the advanced prices being maintained, and made purchases only for early requirements. The demand, however, was well distributed, and indicated the beginning of a large and general business. Makers saw this more clearly than consumers, and were only inclined to sell as their necessities pressed them. At the same time, the inclination among makers to start additional furnaces began. Early in March, it was announced that 2000 tons of iron had been sold to go to the Mississippi River. The Eastern makers were enabled to do this by the advantageous rates of freight that were offered them by the railroad companies, to secure employment for cars that would otherwise have to return empty, while the cost of returning empty cars was but little less than that of loaded ones. This condition of affairs enabled the Eastern makers to control, during the year, a very extensive market, without which not nearly so high a range of prices would have been obtained for anthracite pig-iron.

About this time, there developed a good demand for water-pipes and forge iron. There continued a fair demand through March, with a steady increase in the business with the West, and at the end of the month it was announced that about 63,000 tons of the Philadelphia & Reading Coal and Iron Company's iron, which had been placed in the hands of Messrs. CROCKER BROTHERS in 1877, had been finally closed out ; and that numerous other lots in second hands, which had a depressing effect upon

MONTHS.	AMERICAN PIG-IRON.			SCOTCH PIG-IRON.			RAILS.			WROUGHT SCRAP.
	No. 1.	No. 2.	Forge.	Coltness.	Eglinton.	Glengarnock.	Iron.	Steel.	Old.	
January 1st.....	\$16 @ \$18	\$15 @ 17	\$14 @ \$15	\$22 @ 22½	\$19½ @ \$20	.....	\$32 @ \$36	\$41 @ 41	\$18½ @ \$19½	\$22 @ 20
January.....	16 @ 18	15 @ 17	14 @ 15	22 @ 22½	19½ @ 20	.....	32 @ 37	40 @ 41	18½ @ 20	19 @ 22
February.....	16 @ 18	15 @ 17	14 @ 16	22 @ 22½	19½ @ 20	.....	36 @ 37	42 @ 44	19½ @ 20	21 @ 22
March.....	17 @ 19	16½ @ 17	14½ @ 16	22 @ 22½	20	\$20 @ \$21½	36 @ 37	42 @ 44	20 @ 21	23 @ 24
April.....	18 @ 19	17	15½ @ 16½	22 @ 22½	19 @ 19½	.....	35 @ 36	43 @ 44	20 @ 21	24 @ 25
May.....	18 @ 19	17 @ 18	16 @ 16½	22 @ 22½	19 @ 19½	.....	37 @ 39	45 @ 46	22 @ 23	23 @ 24
June.....	18½ @ 19	17½ @ 18	16 @ 17	21½ @ 22½	18½ @ 19½	19 @ 20	37 @ 40	45 @ 47	23 @ 25	23 @ 24
July.....	18½ @ 20	17½ @ 18	16½ @ 17	22 @ 22½	18½ @ 19	19½ @ 20	37 @ 40	45 @ 47	23 @ 25	23 @ 24
August.....	20 @ 21½	18 @ 21	17 @ 19	22 @ 23	20 @ 21	21 @ 22½	40 @ 42	46 @ 49	25 @ 26½	24½ @ 27
September.....	22 @ 30	20 @ 28	20 @ 27	24 @ 29	21½ @ 26	22½ @ 28	41 @ 46	48 @ 51	27½ @ 30	27 @ 32½
October.....	32 @ 27	30 @ 26	30 @ 26	31 @ 28	28 @ 25½	28½ @ 26	44 @ 53	49 @ 65	31½ @ 33	40 @ 33
November.....	27 @ 28	26 @ 27	25 @ 26	27 @ 28	25½ @ 24½	26 @ 24½	50 @ 57	60 @ 65	31 @ 32	33 @ 37
December.....	27 @ 35	26 @ 34	25 @ 32	27 @ 32½	24 @ 28½	25 @ 30½	53 @ 62	63 @ 77	31 @ 39	32 @ 36
December 31st.....	35	33 @ 34	31 @ 32	32	28 @ 28½	29½ @ 30	58 @ 62	72½ @ 77	38 @ 39	36

the market, were mostly, if not wholly, disposed of. Makers had, by this time, become less anxious to contract for future delivery at the prevailing prices, but had but little expectation of prices which ruled later. The business in April was not important, although prices were quite firm, with an upward tendency. By this time, a number of furnaces had gone into blast, and others were preparing to do so. We also saw one of the safety-valves to overproduction—the scarcity of ores—and predicted that our importations would reach 250,000 tons, whereas, according to Mr. JAMES M. SWANK, they have actually amounted to fully 300,000 tons. A great many of the additional furnaces put in blast were to meet the enormous growth in the demand for Bessemer pig-iron.

May witnessed a very fair demand for all kinds of iron, and a continuation of the growth of the Western business. The demand for forge iron became greater, and a large quantity of Glendon was reported as sold at \$17, early in the month. The number of furnaces in blast continued to increase. At this time, we announced that the great demand for rolling stock for the railroads had made such a demand for car-wheel irons that, were all of the furnaces usually employed in making this iron put in blast, they would not be able to meet the supply. Such has since proved to be the case, and the same condition existed at the end of the year.

June was without special feature. There was a very fair business, prices were firm, and makers less inclined to contract for future delivery. In this month, however, the forces were set in operation which made the "boom" which culminated early in October. Speculators began to enter the market, and at the same time there came a very active demand from all classes of consumers, although there was still but little inclination to follow makers in the upward course of prices.

July registered an advance of about \$1 per ton. Early in the month, as is usually the case, the demand and business were small; nevertheless, prices were quite firm. Before the end of the month, there were a few thousand tons reported in this market, although it was said that the greater proportion of the Lehigh production was going West, and that good brands were becoming quite scarce.

August showed an advance of \$2@2½ per ton. There was a large demand for American iron, while, at the same time, it was announced that about 35,000 tons of Bessemer pig-iron had been purchased to come to this country. Production still continued to increase; but the demand more than kept pace with it.

September gave to the iron trade the grand boom of the year, prices having advanced in that month from \$8 to \$10 per ton; and as to the excitement with makers, consumers, and speculators, it was only surpassed in the latter part of December. In September, there was a very large business, but it was restricted by the scarcity of iron.

In October, as was predicted was likely to be the case, there was quite a lull, and No. 1 pig-iron sagged off from \$30@32 to \$26@27. About 10,000 tons of No. 1 Bessemer iron were offered at \$28 per ton, and did not find takers.

November was even worse than October. No. 1 Lehigh iron sold down as low as \$25 per ton. Speculators and others became scared, and, for a time, the market was considerably demoralized. Before the end of the month, however, the worst had been seen, and there were indications that considerable wants for 1880 would be anticipated before the end of the year.

Early in December, the position changed remarkably for the better, and, before the end of the month, sales of about 200,000 tons for 1880 delivery were reported, and prices had advanced from \$6 to \$8 per ton, closing at the highest point of the year. At the very close of the year, the market was again quiet, but makers had such a comfortable list of orders booked that they were quite independent and strong in their prices.

The lowest price at which good brands of No. 1 Foundry iron were reported to have sold at during the year was \$16 per ton, and the highest \$35, showing an increase of over 118 per cent.

Rails.—The business in these has been enormous, and represents not only nearly all of the requirements of 1879, but the greater proportion of the product of 1880. Prices, however, did not show so great an advance during the year as did other classes of iron. The business was active and the demand continuous throughout nearly the whole year, transactions only having been checked at times by the crowded condition of the order-books of the various mill companies.

January opened with a few orders for steel rails, and a large inquiry, with prices at the lowest point of the year. During the latter part of the month, the Erie Railway purchased 25,000 tons of steel rails at, it was said, \$40@41 at the mills. This, in conjunction with other sales, made the makers stronger in their prices. At the same time, there was a liberal business in iron rails, caused by the differences that existed between the prices of these and the inability of securing suitable deliveries in steel rails. Early in February, 3000 tons of steel were reported to have sold at \$42 at mill, and the inquiry for iron rails was improving. There were other important sales during the month, but the mills were so well filled with orders that but little encouragement was given to buyers.

March opened with a sale of steel rails at \$45 at Amboy, and a large

demand, especially for early delivery. During the latter part of the month, sales of about 15,000 tons of steel rails were reported, including 8000 tons to the New York Central Railroad Company on private terms, and 3000 tons at Pittsburg at \$44. The tendency of prices was upward.

Early in April, it was announced that Mr. WILLIAM H. VANDERBILT had purchased 12,000 tons of English steel rails at a price equal to \$55 laid down here, with a guarantee of their lasting ten years. As the price paid for these rails was from \$10 to \$12 higher than American rails could be purchased at the time, it caused considerable discussion, without, however, showing the real cause for paying this difference in price. There was a moderate business in steel during the month, while, late in the month, a sale of 5000 tons of iron was reported at \$35@36 here.

There was a moderate business in steel rails in May, and 1000 tons of American steel were reported sold to WILLIAM H. VANDERBILT, thereby adding confusion to his large purchase of English rails. Before the middle of the month, sales of about 20,000 tons of iron rails were reported, and prices advanced from \$1 to \$2 per ton. This, however, put the price up to where English rails could compete in some instances. For early delivery, small lots of steel rails sold at \$47 at tide-water; while for fall delivery, 3000 tons sold at \$45@45.25 at tide-water.

Early in June, 12,000 tons of steel rails sold at \$49.50 per ton for delivery at St. Louis, from August, 1879, to February, 1880, and 2000 tons of iron rails, at \$39.50, for delivery here. It was then said that the iron rail mills had orders booked that would keep them running for several months, and mills that had been idle for years began to resume operations or prepared to do so. A little later in the month, it was said that, for steel, \$47 had been refused for delivery in the spring of 1880, and that for early delivery a sale had been made at \$46 at mill, and, still later, that a sale of 6000 tons had been made at \$45, at Hoboken, for delivery in December, January, and February. The month closed with a good inquiry for iron rails, but no quoted business.

During the month of July, sales of about 80,000 tons of steel rails, mostly for 1880 delivery, were reported, and values appreciated about \$1 per ton. There was but little business reported during the month in iron rails, although there were constant transactions. Late in the month, sales of 2000 tons for August, September, and November delivery were announced at \$39.50@40.50; 3000 for October and November delivery at \$41; and 7000 tons of English at \$40@40.50.

August was a fairly active month, and particularly for iron rails, the sales reported aggregating about 25,000 tons, a large proportion of which was English, at about \$41 per ton. Of American, 1500 tons sold at Chicago at \$44. Iron rails had now advanced from \$7 to \$10 per ton. The reported transactions in steel amounted to about 30,000 tons, of which amount 10,000 tons sold at \$50 for delivery in 1880. The month closed with an active demand for both iron and steel rails.

September opened with the order-books of the steel mills well filled, and as the mill companies could not execute orders if they accepted them, there was a disinclination to accept them or to continue to advance prices, fearing that, if they did, an influence would be brought to bear on Congress at its next session to reduce the duties. Before the middle of the month, however, sales of 5000 to 6000 tons were reported at \$48@49 here for future delivery, and later in the month, 75,000 to 80,000 tons for delivery in 1880, at about \$48 at mills. The latter sales were mostly to the Erie and Pennsylvania railroads, and showed great foresight on the part of the respective managements of these lines.

In October, the reported transactions amounted to about 200,000 tons of steel rails, mostly for 1880; and sales were made up to \$50 at the mills with \$52@55 asked. Late in the month, 10,000 tons of English iron rails were reported as sold at \$43.

The business in steel rails continued quite large in November, the reported sales amounting to about 60,000 tons for 1880 delivery, while it was estimated that the total sales for delivery in 1880 had amounted to from 500,000 to 600,000 tons. Makers were pretty well out of the market by the end of the month, and prices were advanced, nominally at least, about \$10 per ton; and among the transactions mentioned was one of 7000 tons of Prussian steel rails at \$60 per ton.

December started quietly, but before the end of the month 4500 tons were reported to have been sold at \$65 at the works, and small lots at \$70. In iron rails, there were sales of from 12,000 to 13,000 tons of American at \$57.50, and about 15,000 tons of English at prices not mentioned. There were also from 10,000 to 12,000 tons of English steel rails reported as sold.

Scotch Pig-Iron.—The first six months of 1879 were without especial feature for Scotch pig-iron in this market. Prices in Scotland advanced some, as did freights, but this made no impression on our market. The lowest prices quoted for Scotch iron were late in June, at which time the importations were increasing, and more iron was being forced upon the market than it would take.

In July, prices in Glasgow advanced, and freights, which had previously got down to nothing, advanced to 5s. per ton, and a liberal business developed. The demand increased considerably this month, coming from both speculators and consumers.

In August, the demand was quite good, with liberal arrivals, and prices

recorded an advance of about \$2 per ton. The demand from all parts of the country began to come in, and speculators saw, in this article, a promising chance for a speculation, and began to order quite freely for shipment from abroad. The demand continued during September, and, upon the announcement that a number of furnaces would blow out in Scotland, and that prices had advanced in Glasgow, while freights were higher, the market became quite excited here. Prices advanced, during this month, from \$3.50 to \$5 per ton.

During the early portion of October, the same condition of affairs existed as at the end of September; and it was found that the stock here was but small, and held at higher prices than were generally offered. During the latter part of the month, however, large speculative lots began to arrive, the demand fell off, and prices declined nearly as much as they had risen.

During November, the arrivals were between 20,000 and 30,000 tons, and the demand very moderate. The result was great demoralization, and prices declined to a point \$3 to \$4 below what they were in September.

Early in December, the market was somewhat unsettled, owing to the large arrivals, stocks, and expected shipments. After the middle of the month, in sympathy with the advance in Scotland and the great excitement in American pig-iron, the demand began to improve, and the month closed with the highest prices of the year, although the stocks were greater than at any time in twenty years.

Old Rails.—The lowest price for these was recorded in the very beginning of the year, and they appreciated almost steadily until the end of the year. There was an active demand throughout the whole year; but as a great portion of the supplies were for a time secured from railroads near the mills, the transactions did not come to the attention of the public. About May, large quantities of foreign rails were offered, and after that time, a steady and very large business came to our notice, and at the end of the year the highest prices were recorded, with a demand far exceeding the supply, and all available stock throughout the world practically engaged.

Wrought Scrap.—During the early portion of the year, this article was scarce, quiet, and inclined to advance but slowly. As soon as the price here reached a point that would admit forcing supplies, there became more activity, and during the last half of the year a very liberal business was noticeable, at prices which, with but little variation, were advancing, until the highest prices of the year were recorded at the close.

UTAH'S MINERAL PRODUCT IN 1879.

Messrs. WELLS, FARGO & Co., according to the January 1st number of the Salt Lake *Daily Tribune*, gives the following recapitulation of the mineral production of this territory:

2,301,276 lbs. refined lead at 4 1/4 c. per lb.	\$103,557.42
26,441,359 lbs. unrefined lead at \$45 per ton	594,930.57
3,835,047 oz. silver at \$1.10 per oz.	4,218,551.70
19,932 oz. gold at \$19 per oz.	302,708.00
Total	\$5,219,747.69

The above includes the product of ores received from Idaho, Montana, and Nevada, aggregating 126,000 lbs. lead, 102,800 oz. silver, and 200 oz. gold.

WELLS, FARGO & CO'S REPORT OF THE PRECIOUS METAL PRODUCTION FOR 1879.

The annual statement of Messrs. Wells, Fargo & Co. gives the production of the precious metals in the States and territories west of the Missouri River, including British Columbia (and receipts in San Francisco by express from the west coast of Mexico), during 1879, which shows aggregate products, as follows: Gold, \$32,539,920; silver, \$38,623,812; lead, \$4,185,769. Total gross result, \$75,349,501; being less by \$5,805,111 than for 1878. California shows a decrease in gold of \$140,342, and in silver of \$539,146—a net decrease of \$729,488. Nevada shows a total falling off of \$13,184,235, the yield from the Comstock being only \$8,830,562, as against \$21,295,043 for 1878—a decrease of \$12,464,481 from that locality. The product of Eureka District is \$5,859,261, as against \$6,981,406 for 1878—a decrease of \$1,122,145. Utah shows a falling off of \$595,734. Colorado shows an increase of over \$8,000,000, chiefly from Leadville District. It has been exceedingly difficult to arrive at the actual production of Leadville, the two most reliable reports varying more than \$2,000,000. The company has adopted an average based upon the conflicting figures. Dakota shows an increase of \$993,183. The product by States and territories is as follows:

California	\$18,190,973	New Mexico	\$622,800
Nevada	20,997,714	Arizona	1,942,403
Oregon	1,037,961	Dakota	3,208,987
Washington	85,336	Mexico, west coast	1,683,871
Idaho	2,091,300	British Columbia	976,742
Montana	3,629,020		
Utah	5,488,879	Total	\$75,349,501
Colorado	14,413,515		

The bullion from the Comstock lode contains 41.20 gold and 58.80 silver. Of the so-called base bullion from Nevada, 27 per cent was gold, and of the whole product of the State 27.50 per cent was gold. The gross yield for 1879, shown above, segregated, is approximately as follows: Gold, 43.20 per cent, \$32,539,920; silver 50.25 per cent, \$38,623,812; lead 5.55 per cent, \$4,185,769; total, \$75,349,501. The outlook for 1880 does not indicate a greater product than for 1879. The exports of silver during the

present year to Japan, China, India, the Straits, etc., have been as follows: From Southampton, \$33,000,000; Marseilles and Venice, \$5,000,000; San Francisco, \$3,000,000; total, \$46,000,000, as against \$39,000,000 from the same places in 1878. Overland shipments of treasure from San Francisco during the last half of December via Wells, Fargo & Co.'s Express, amounted to \$161,300, consisting of \$122,000 in gold coin, \$27,500 in currency, \$8600 in silver coin, and \$3200 in silver bullion.

THE DIAL COMPASS IN TOPOGRAPHICAL AND GEOLOGICAL RECONNOISSANCE AND PROSPECTING.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: An inquiry from Professor Pumpelly, U. S. Geologist, as to the best form of dial compass for "making sketch maps in magnetic regions," leads me to believe that an account of this little-known instrument would possess interest for some of your readers.

Such an account is especially due to the Institute of Mining Engineers, before whom I exhibited such a compass of my own design, at the New York meeting, in 1877, and promised a brief descriptive paper, which sickness at the time prevented me from preparing.

Whoever has had occasion to make geological or topographical sketches in the iron regions of New York or New Jersey, the Lake Superior Basin or Missouri, or in Sweden and parts of Germany, as I have done, has felt the need of a hand instrument which would with approximate accuracy indicate the meridian. It is often practically impossible to do this with the pocket compass in the time usually at one's disposal. The needle is liable to stand at all angles with its normal direction up to 180°. Again, the field geologist and prospector often desire to know if they are in the presence of rocks containing magnetite.

This mineral, in the form of disseminated grains forming an accidental constituent in many of the older rocks, as well as in beds of workable ore, is very common over extensive areas; and it is the only mineral or ore the presence of which, together with a roughly approximate idea of its relative quantity, can be determined without seeing the rock. Snow, earth, rock, mud, and water are equally transparent to the magnetic rays. Distance does not, however, lend enchantment to the view; for the force diminishes *theoretically* as the square of the distance; and practically, we rapidly get beyond the observable influence of the most powerful local attractions.

In my Michigan and Wisconsin* surveys, I have traced and mapped rock-beds containing more or less magnetite for miles, in all their sinuous windings, without ever seeing an outcrop or boulder, thus obtaining a clew to the structure which one hundred times the same cost spent in digging would not have given.

Two instruments only have, so far as I know, been heretofore used in this country in work of this nature:

1. The Burt Solar Compass, largely employed in United States linear surveys for the past forty years, and to a very limited extent in other surveys. This instrument is too well known to require description. It needs to be set firmly on a tripod, and is thus distinguished from the class of instruments to which my dial compass belongs.

2. The Miner's Dip Compass in many forms—an old instrument, having originated possibly in Scandinavia, and very extensively used in this country. In my Michigan Report, Vol. I., 1873, I describe the use of this instrument under "Magnetism of Rocks, and Use of Magnetic Instruments in Prospecting for Iron Ores."

This paper, so far as I know, was the first published on this subject. Subsequent experience has suggested no important additions, so far as the dip compass is concerned. Since that date, there have appeared in Europe many valuable papers on this general subject; with the later ones I am not acquainted. Conspicuous are those of Professor Thalén, of Upsala, Sweden. His magnetometer is unquestionably a valuable instrument for surveys of magnetic rocks, especially in a comparatively sunless country like Sweden. I purchased one and learned its use in Stockholm, but have had no occasion to put it to a practical test here. The fatal objection to its use in rapid reconnaissance and superficial prospecting over large areas in this country is the fact that it requires to be mounted on a tripod, and in order to map its results one has to have the equivalent of a dial compass; for it does not give the meridian. For a detailed and exhaustive magnetic survey of a limited area, the problem I conceive which is usually presented in Scandinavia, it undoubtedly has its place. The fact that it can be used when there is no sunshine and when one is entirely ignorant of directions, is a fundamental advantage. Neither the dip compass nor Professor Thalén's magnetometer, however, orients us. They tell us magnetite is near at hand; but which way is it? That is the next important question. And when we have found it, how shall we fasten it on to our work—locate it?

Turning to the sun with our dial compass, and obtaining local time from our watch, we turn the instrument until the shadow of the gnomon cuts the proper hour, and we are oriented: we stand square with the world. If we are prospecting for iron ore, or making geological observations, then we must swing the rudder of the compass, the vernier having been previously set to the proper declination, and we at once read the number of degrees of local variation and the approximate direction of the magnetite producing it.

It is safe to say that, more than nineteen times out of twenty, the north end of the needle tends toward the ore, its actual direction being a resultant of the constant force of the earth and the local force.

Only a brief mention is made of the dial compass in my paper above named, because at that time I had not brought its construction and use to any degree of perfection, although I had been experimenting with it several years. I made the first surveying dial I ever saw in 1867, and used it in the Marquette iron region.† I could not, practically, make much out of the common Chinese and European dial compass—a toy-like instrument, which, although embracing the whole idea, was of but little use,

* Mich. Geo. Survey, 1873, Vol. I. Wis. Geo. Survey, 1886, Vol. IV., Part VII. (about to be published).

† The last and most perfect form of this instrument, designed by me, was made and many times duplicated by F. Kroedell, 52 Nassau street, New York. A large number of the results obtained by this instrument will be found in the Wisconsin Report, now about to be issued. Messrs. Gurley, of Troy, N. Y., are now making several forms of the dial compass. One, a tripod instrument, designed to do approximately as good work as the solar compass, was submitted for my inspection, and seems to possess the elements of a useful surveying instrument.

since it was made to give the hour of the day when there was no local attraction. So, after all, my own labors, and those, I dare say, of many others in this direction, have resulted only in improving the form and finding a new use for this poor little compass sun-dial found in all the shops, which had, in this era of \$5 watches, lost its value as a time-piece.

The advantages of the dial compass in mineral prospecting and scientific reconnaissance are:

1. Held in trained hands, it will indicate the true meridian within a maximum error of 3°, the observation occupying but a fraction of a minute. So quickly is the observation made that my assistants often use it in running lines where there is no special occasion for it, since they save the time required by the magnetic needle to settle.

2. If there is any mass of magnetic ore or rocks containing disseminated magnetite in the vicinity (I have been made aware of their presence at distances of over one half-mile), the north end of the needle will be deflected toward them in amount depending on (a) the distance, (b) the direction, (c) the quantity of the magnetite, (d) the position and structure of the magnetic rock, as to *strike, dip, joints*, etc. etc.

3. The exact position of such rock can be found, when concealed from view, by going in the general direction indicated by the needle. When the bed containing magnetite is crossed, the direction of the variation will be at once reversed, so that it is easy to place one's self exactly over it.

By thus fixing a number of points, we may map its position, and probably trace it to where it outcrops, which may be miles away. It is only by seeing the rock that we can determine its exact character, and especially if it be a merchantable ore.

In all magnetic iron regions I have examined, it is usual to find attractions, more or less strong, fifty times, to one deposit of workable ore.

One great advantage possessed by the dial over the dip compass is that, owing to the greater sensitiveness of a horizontal needle, and to the fact that it is amenable to a force acting nearly horizontal, it will be affected at far greater distances than the dip compass—at least, ten times as far. This longer range, in connection with the fact that it is a surveying instrument, fits it especially for the use of the topographer and geologist. The iron-ore prospector needs the dip compass in addition.

If this is published, I hope Prof. RAYMOND will add a list of the recent literature on the subject, especially in Swedish and German. If I knew more of it, I dare say much of this rambling article might have been omitted, and its place supplied by references to more valuable and pertinent matter. This remote Colorado mining village does not contain a library of reference, nor is the atmosphere favorable for writing about iron-ore prospecting.

Very respectfully yours,
T. B. BROOKS.

DUDLEY, PARK CO., COLO., Dec. 29, 1879.

OHIO IRON AND COAL TRADE.

Special Correspondence of the Engineering and Mining Journal.

The continuance of the strike in the Massillon District is the more serious as it is the most productive mines that are being unworked. The question is not one of wages, but of screening; and the prospect is, that the strike will be prolonged. Numbers of miners are leaving the district; one coal operator states to-day that two thirds of his men have left. A statement put forth as to the insufficiency of the coal-carrying facilities of the Hocking Valley Railroad would seem to be without foundation, as all orders from Cleveland are filled promptly. This city's receipts of bituminous coal, by rail and canal, in 1879, amounted to 1,500,620 tons; of anthracite, 76,187 tons; of ore, 524,402 tons. The Ohio demand for American-Scotch iron (made from our native ores) absorbs the whole of it; and here, as well as in other Western States hitherto supplied with it, the requirements in this line have to be met by drawing on the Scotch imported iron. Sales of pig-iron at \$40, at furnaces. Price of ore advancing. Sales of Lake Superior are at from \$12 to \$16 per ton.

CLEVELAND, O., Jan. 8, 1880. C.

ORE PRICES OF THE BOSTON & COLORADO SMELTING COMPANY.

The Boston & Colorado Smelting Company pays for gold and silver ore delivered at its works at Argo (near Denver), on the following basis:

For ore assaying under \$400 per ton, deduct 10 per cent of the value of the gold (figuring gold at \$20 per ounce); 15 per cent of the value of the silver (figuring silver at the market rate in New York), and \$20 per ton.

For ore assaying from \$400 to \$600 per ton, deduct 9 per cent of the gold, 14 per cent of the silver, and \$20 per ton.

For ore assaying from \$600 to \$800 per ton, deduct 8 per cent of the gold, 13 per cent of the silver, and \$20 per ton.

For ore assaying over \$800 per ton, deduct 7 per cent of the gold, 12 per cent of the silver, and \$20 per ton.

For the copper contents of any gold or silver ores coming under the foregoing schedules, two dollars will be paid for each per cent as shown by the dry assay.

Special rates given for lead ores, and for matte and other furnace products.

No charges are made for crushing, sampling, and assaying ores purchased by this company.

THE LABOR QUESTION.

St. LOUIS, Jan. 6.—Nearly 1000 coal miners, representing all the Miners' Lodges in St. Clair's District, Illinois, assembled in mass meeting near French Village, about eight miles from East St. Louis, yesterday afternoon, and discussed their grievances pretty freely. They say that, in consequence of the heavy increase in the cost of blasting-powder, miners' oil, and of all articles of family consumption, they must have higher wages. No definite action was taken yesterday, but the regular delegate meeting will be held at East St. Louis to-day, at which, it is probable, a formal demand will be made on mine owners and operators for four cents per bushel for mining, and if this demand is not complied with, the entire district will go on a strike.

MORRISTOWN, N. J., Jan. 8.—The miners in four of the mines near Do-

ver, Morris County, have struck for an advance of from \$1.25 to \$1.50 per day. The orders for ore are largely in excess of the amount mined; and it is expected that the men will get the desired advance.

The miners employed along the Monongahela and Youghiogheny rivers, in convention, to-day, demanded three and one half cents per bushel for digging, an increase of half a cent. If the terms are not granted, a strike will begin on the 12th inst.

The Reading Railroad Company gives notice to the employes of the company that it will increase the minimum which governs the wages paid by the Coal and Iron Company 4 per cent, so that the wages for January will be but 4 per cent below the basis. In issuing this notice, President Gowen says: "While congratulating you upon the advent of a year which is undoubtedly to be one of great prosperity, the managers desire to thank you all most sincerely for the fidelity you have shown to the interests of the company during the long period of depression through which it has safely passed."

AMENDMENTS TO THE MINERAL LANDS LAW.—A bill passed the House of Representatives on the 6th inst., the purport of which is to add to the existing law the provision that, when the claimant of a patent is not a resident of the land district, the necessary application and affidavits may be made by his authorized agent; also, that the period within which the work required to be done annually on all unpatented mineral claims shall begin on the 1st of January succeeding the date of the location of the claim, and that this section shall apply to all claims since May 20th, 1872.

A correspondent, writing to the New York Tribune under date of Washington, January 7th, says:

"There are in the House several members who aspire to become bonanza kings, and who have improved the last vacation by investing in mining claims in the West. To-day when a bill was reported from the Committee on Mines and Mining to permit a person to secure a patent for a mining claim without taking the trouble to visit the ground in person, these members, who had never before wasted a thought on the mineral land laws, were all agog."

IMPORTS OF COAL AT TORONTO.

The following statement shows the quantity and the value of coal imported and entered for consumption at the port of Toronto, from July 1st, 1878, to November 30th, 1879:

ARTICLES.	FROM JULY 1ST, 1878, TO JUNE 30TH, 1879.				
	IMPORTED.		ENTERED FOR CONSUMPTION.		
	Quantity.	Value.	Quantity.	Value.	Duty.
Coal—	Tons.	\$	Tons.	\$	\$
Anthracite, to March 14, 1879*	71,426	248,773	71,426	248,773	.....
" from March 14, 1879†	31,950	97,429	7,990	25,199	3,994.87
Bituminous, to March 14, 1879*	84,899	250,063	84,899	250,063	.....
" from March 14, 1879†	8,690	25,291	6,329	18,734	3,164.43
Total.....	196,965	621,466	170,644	542,709	7,159.30

*Free.

†Dutiable.

ARTICLES.	FROM JULY 1ST, 1879, TO SEPTEMBER 30TH, 1879.				
	IMPORTED.		ENTERED FOR CONSUMPTION.		
	Quantity.	Value.	Quantity.	Value.	Duty.
Coal—	Tons.	\$	Tons.	\$	\$
Anthracite, from March 14, 1879*	44,562	131,621	27,627	82,532	13,813.76
Bituminous, from March 14, 1879*	24,968	72,537	20,651	61,534	10,325.74
Coke.....	13	26	13	26	6.50
Total.....	69,543	204,184	48,291	144,092	24,146.00

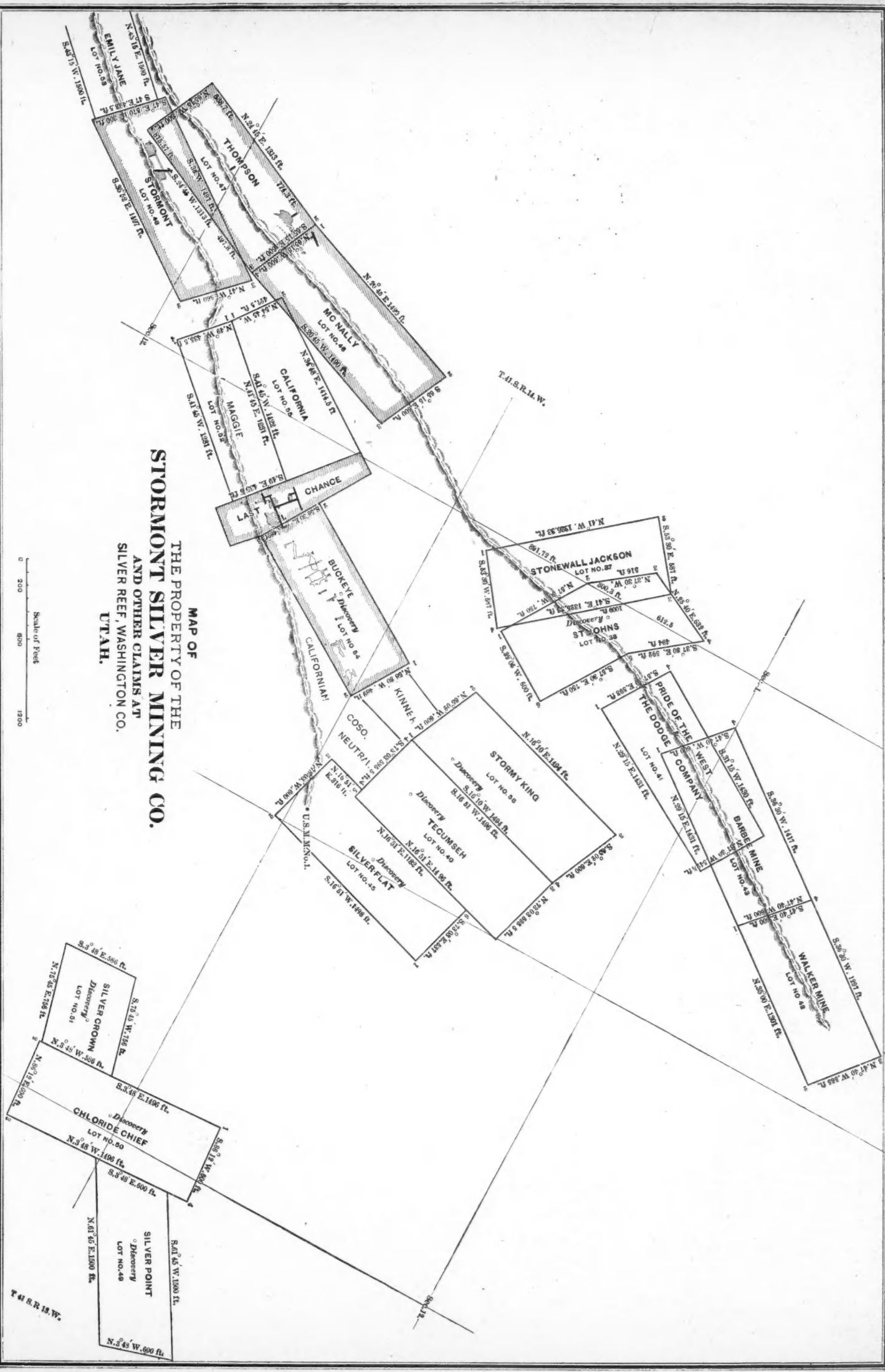
*Dutiable.

ARTICLES.	FROM OCTOBER 1ST TO NOVEMBER 30TH, 1879.				
	IMPORTED.		ENTERED FOR CONSUMPTION.		
	Quantity.	Value.	Quantity.	Value.	Duty.
Anthracite.....	Tons.	\$	Tons.	\$	\$
Bituminous.....	"	"	"	"	"
Total.....	.....	.....	29,833	87,517	14,916.50

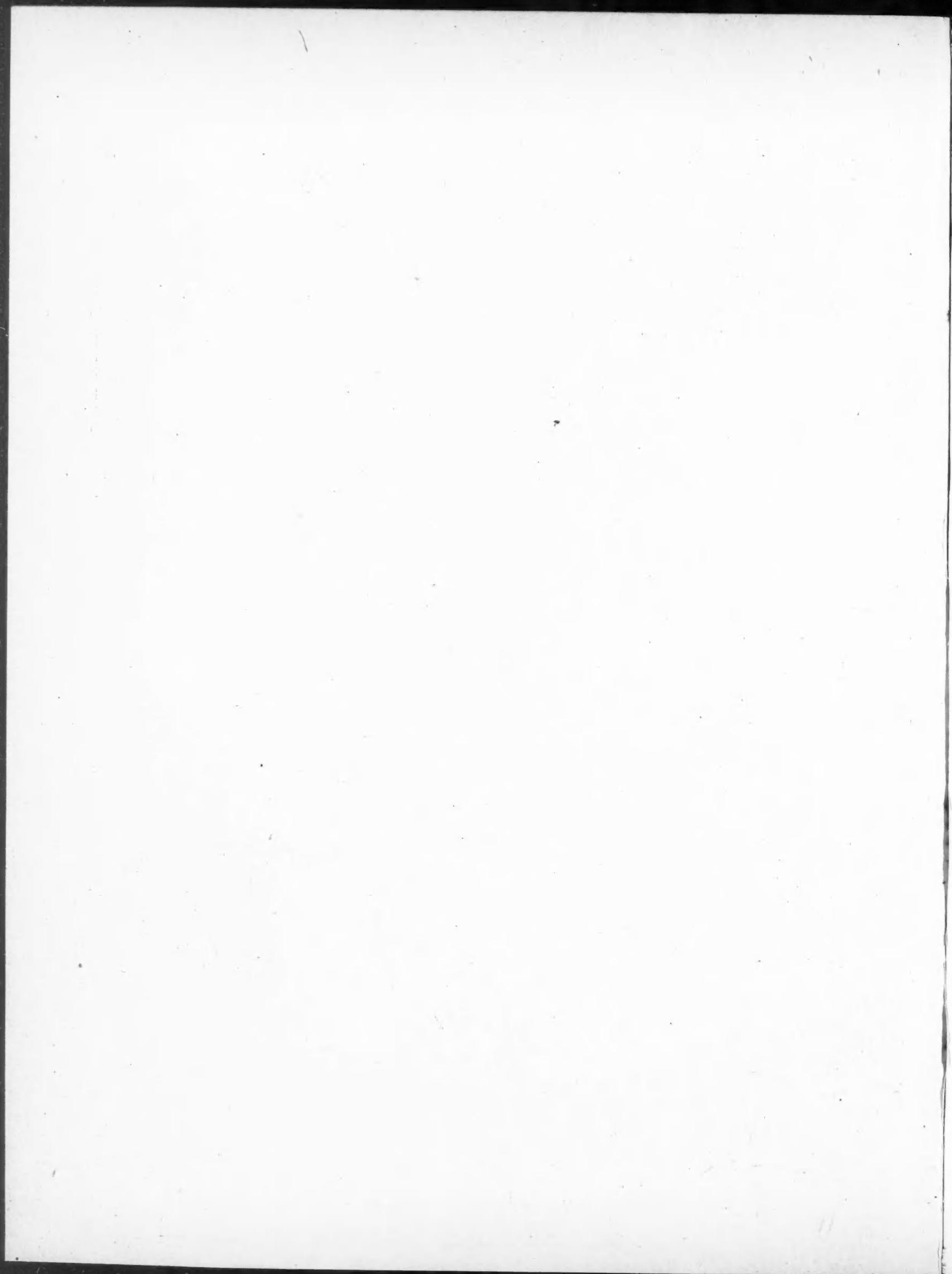
*Statistics of imports not yet in possession of this Department.

J. JOHNSON, Commissioner of Customs.
CUSTOMS DEPARTMENT, OTTAWA, Jan. 3, 1880.

PROGRESS OF THE HUDSON RIVER TUNNEL.—We learn direct from the engineers that the "air lock" is working much better than was expected. The material reached is an indurated silt, of a nature most favorable to success. The report is that it is "working fairly," with a pressure of from ten to thirteen pounds per square inch, all that is required to hold the earth back. The brick wall leaks some, but not badly.



MAP OF
THE PROPERTY OF THE
STORMONT SILVER MINING CO.
AND OTHER CLAIMS AT
SILVER REEF, WASHINGTON CO.
UTAH.



PROGRESS IN SCIENCE AND THE ARTS.

Geology—Mineralogy.

Artificial Production of Diamonds.—The daily papers of the past week have widely published the announcement that Mr. James Maclear, of St. Ralox Chemical Works, Glasgow, had made a statement to the Glasgow Philosophical Society representing that he had succeeded, after thirteen years of investigation, in producing the diamond by artificial means. The accounts further declared that the results had been submitted to Professor Tyndall and Mr. Maskelyne, of the British Museum, by whom they were pronounced to be unquestionably diamonds. These announcements are doubtless premature; they are certainly so respecting Mr. Maskelyne, who has since publicly stated his belief that the crystals submitted to him were not diamonds, but probably crystals of a silicate. As to Professor Tyndall's reported confirmation of the identity of these crystals with the diamond, we have carefully looked over the accounts of the circumstance as published in several of the leading English technical journals, and fail to find any statement purporting to come from him. The simple fact is named, in relation to these gentlemen, that Mr. Maclear had submitted samples of what he affirmed to be diamond crystals to them for examination. Our purpose in writing the above is simply to protest against the hasty conclusions on scientific subjects, which the newspapers are prone to accept and circulate without due reflection and before they are verified by competent authority. There is nothing inherently impossible in what Mr. Maclear asserts he has succeeded in accomplishing, although many experimenters have essayed the same problem and failed. We prefer, however, to wait before accepting this piece of newspaper science, until we hear definitely from Tyndall or Maskelyne. The latter has already spoken, as above stated, and adversely; though, in justice to Mr. Maclear, we must add that he affirms Mr. Maskelyne to be wrong, and asks a temporary suspension of judgment.

Oxidation of Iron and Steel when in Contact.—Mr. G. Radcliffe, in a paper read before the Iron and Steel Institute of Great Britain, incidentally mentioned a case in which steel boiler-plates, which had been exposed to the same conditions as adjacent iron plates, had distinguished themselves by pitting more than the latter. The steel plate next to the iron one was oxidized considerably more than any other. This fact would appear to point to a species of galvanic action set up by the contact of the two varieties of metal in an exciting liquid, the steel playing the part of the positive element. Mr. Radcliffe does not attempt, however, to offer an explanation, but simply concludes that, under the above-named circumstances, it will not do to place iron and steel side by side.

Technical Notes.—Great improvements have lately been effected in the management of the *indigo* crop in India, which have resulted in an increase both in the quantity and quality of the product.—A German inventor substitutes paper for wood in the manufacture of *lead-pencils*. The paper is steeped in an adhesive liquid and rolled round the core of lead to the required thickness. When finished, the pencil resembles an ordinary cedar pencil.—The immense growth and prosperity of the *paper trade* in the United States, which has steadily grown, even through the years of business depression from which the country has just emerged, is shown by the following comparative figures: 1869—Imports, \$8,527,465; exports, \$3777; 1879—Imports, \$126,863; exports, \$1,293,312. The imports of this class of goods at present consist almost exclusively of fashionable and fancy writing and wall papers, and are drawn chiefly from France.

Engineering—Mechanics.

The Tay Bridge, which broke on the evening of the 28th of December, and precipitated a train of the North British Railway into the river below, was one of the most important engineering works in Great Britain. It was commenced in 1841, and finished in 1877, in the face of unusual difficulties, by Sir Thomas Bouch. It comprises 85 spans, and has a total length of 10,321 feet (or nearly 2 miles). The reports of the disaster to the bridge, given in the daily papers, state that 12 spans gave way, and dropped into the river. The cause of the accident has not as yet been ascertained with certainty; opinions being divided as to whether the broken portion of the bridge was carried away before the train entered upon it by the hurricane that was raging at the time, or whether it broke under the load of the train. The legal investigation of the accident, which is to take place, will, no doubt, ascertain the true state of the facts. Meantime, it will be of interest to notice that the official test of the structure, which was made before it was opened to traffic, was pronounced to be entirely satisfactory by the best authority in the United Kingdom. *Engineering* spoke of it as follows: "The result (of the official test) is the complete establishment of this fact, so important to the public, that the bridge is strong out of all proportion to its possible necessities. As a matter of fact, the load which the structure is calculated to carry is six times greater than that to which it was subjected by General Hutchison." The constructor of the bridge is reported to have stated, as his opinion, after an inspection, that the accident could only be accounted for on the supposition that the train ran off the track, and thus tore the structure to pieces. A thorough investigation of the cause of this grievous disaster is rendered the more imperative, as another bridge of the same kind is contemplated over the Frith of Forth.

African Projects.—The French government is reported to have appointed a commission to conduct investigations preliminary to the construction of a railway across the Desert of Sahara to the river Niger; and French engineers are said to be now at work exploring the line of the proposed road as far as the Laghouat on the south. M. Saleillet, an engineer, has been charged with the examination of the unexplored regions lying to the east of the colony of St. Louis, in Senegal, as far as Timbuctoo. This gentleman advocated, at a late meeting of the Paris Geographical Society, the construction of a railroad from Dakkar, on the Atlantic, to St. Louis; the opening of the river Senegal to navigation as far as Bafoulabé; and the union of the Senegal with the Niger by means of a canal from this point to Bamakou on the last named river. The Niger is now navigable from Bamakou to Timbuctoo, and lower down for a distance of 1500 miles. The total expense of this work M. Saleillet places at \$5,000,000. The population that it would unite in commercial relations is about 37,000,000. The country it is proposed to open by these

several projects is represented as being rich in various commercial products, and peopled by intelligent races, who, it is believed, would favor, rather than hinder, their execution. The Government Commission is said to have approved M. Soleillet's plans, and the survey for the canal is to begin at once.

A School of Mechanical Handiwork.—Following the excellent example of the Worcester Free Institute, and in obedience to a long-felt want for such a school, the managers of the Spring Garden Institute, of Philadelphia, have decided upon the establishment, in connection with this institution, of a school where apprentices and amateurs may acquaint themselves, practically, with the use of tools for working wood and metal, and, at the same time, acquire a knowledge of mechanical principles. This branch of the Institute is now ready to go into operation, and a circular has been issued announcing that the managers are ready to receive applicants for admission. The pupils, we learn, will be furnished by the Institute with work-benches and the tools and materials required for practice. There will be conversational lectures on the nature and properties of materials, and practice shops in charge of experienced workmen as instructors, fitted with improved appliances, where the learner will be taught the right mode of holding, using, and caring for tools, etc. The practical instruction will include, in wood-work, carpentry, and joining, wood-turning, and cabinet and pattern-making; and, in iron-work, forging, foundry-work, and machine-tool work. This is the plan of the school, and the managers expect to gradually develop it fully up to this pattern as rapidly as the number and requirements of its pupils demand. The design of the school is most admirable, and it is sincerely to be hoped that it may really become what the managers announce their design to make it.

Engineering Notes.—Of the present state of work at the *St. Gothard tunnel*, it is reported that a serious obstacle has lately been encountered in some soft strata, the enormous pressure of which has, up to the present, resisted all attempts at successful penetration. The most solid beams are bent after a little time, and a resistance-wall of 1 meter thickness was completely crushed. Another of 2 meters thickness is now constructing. In these strata, the boring-machine is useless, and only hand-labor can be employed.—The daily press of the past week chronicles the arrival, at the Isthmus of Panama, of M. de Lesseps, with a party of engineers. The first work of the party, it is noted, will be to verify disputed points in the existing surveys of that portion of the Isthmus. Lesseps is reported to have declared his unshaken faith in the practicability of the *sea-level canal* approved by the Paris Conference.—A bill has been introduced into the National House of Representatives for the creation of a permanently deep, wide, and straight *channel through Sandy Hook* bar to the port of New York.—On the 8th of December, preliminary work for the driving of the *Mersey tunnel* was commenced. The engineers will drive trial headings both from the Liverpool and Cheshire sides of the river, to determine the nature of the strata to be encountered before beginning the main railway tunnel.

GENERAL MINING NEWS.

COLORADO.

THE MINES OF PARK COUNTY.—The *Fairplay Flume* of January 1st, says: "Our readers know that 1879 has been a year of unusual prosperity to Park County; that while all of the older mines have yielded bounteously, numerous new discoveries have been made that are already developed so as to prove them immensely valuable as future bullion producers. Of this class are the Fanny Barret, Bonanza King and its extension, Black Hawk, Emma, Earnest, and others. A system of deep prospecting has been inaugurated in nearly every one of the tributary districts, which, backed as it is by ample capital, is bound to produce advantageous results. The coal mines have been opened extensively, and are rapidly increasing their production. At least fifty powerful individuals and corporations are preparing for the busy prosecution of work, new coal combinations are forming to operate in the county, coke will be added to our varied products, reduction-works are ready for a start, and will be started in a number of localities, notably Sacramento, Pennsylvania, Horseshoe and Mosquito gulches, and others are promised to be constructed on Buckskin Gulch and at Montgomery. The mineral production, principally gold and silver, has reached the sum of \$430,000, of which amount a fraction under \$225,000 has been disbursed for ore by the Boston & Colorado Company's agency at Alma. The amount stated includes also several thousand dollars' worth of ore now in the hands of the different smelters. It is well known that the insufficient water supply cut down the yield of placer gold one half, and we only credit \$46,000 to this source. The coal mines at Como have produced on a close estimate 3000 tons of fuel worth \$12,000. The county now contains over seventy miles of completed railroad as against nineteen in 1878. Four smelters have been built or refitted during the year, the Mosquito Pass toll-road was built, and two new railroad lines projected.

THE BREECE MINE.—The superintendent, under date of December 31st, says: "There are now 500 tons of iron on the dumps, and all the pits are in a condition to allow any amount required to be taken out. The mine throughout never looked as well as now; both inclines are in splendid ore. We will start the machinery on Monday and commence sinking the two shafts again. We have the building completed over the machinery. The Little Prince has good ore also. I will push the sinking of the shafts so as to get to the ore our neighbors are finding all around us."

THE ROBERT E. LEE MINE.—The *Herald* says: "The main level in the mine, extending from the new shaft toward and under the great body of rich ore found in the old workings, is extending slowly, owing to the fact that intensely hard rock has been encountered. Developments are being carried on from the old shaft, with a view of showing up what is in the mine. A small quantity of ore has been constantly mined from these developments, and large quantities exposed to view which are not being mined. Recent developments have exposed, 60 feet from the old workings, an immense body of rich ore; in fact, what seems to be the same body that produced the immensely rich ore that was mined during September. At the end of a drift run from the old shaft, and, as said above, 69 feet from the richest portion of the old workings, a body of ore has just been reached that is now 22 feet in thickness. A stratum of mineral of the same character of chlorides formerly found in the mine has been reached that contains upward of 9000 ounces of silver to the ton. This mine has produced the richest ore ever found in the camp, and from one small shaft, with a whim, \$500,000 were taken out in ten weeks. But the indications are, that the future workings will far exceed any thing the mine has heretofore produced."

THE PENDERY COMBINATION.—The *Reveille* of December 25th says: "The Glass mine, belonging to the Pendery Combination, is situated on Carbonate Hill, just below and west of the Carbonate mine. It is opened by a straight perpendicular shaft, 235 feet deep.

"The drifts will average up about 1200 feet in the aggregate. Some of them are driven simply for prospecting purposes, and in most there is a fine body of good ore. In some places it is over 14 feet in thickness, and neither top nor bottom of the deposit has been reached. There is one block of ore 125 feet square, which will average three or four feet in thickness; in places it is of unknown size. The ore is a true carbonate and galena, with a considerable per cent of sand carbonates, all very rich in lead and most of it carrying a good value in silver. It all averages up good, and more than pays all expenses for mining, although no stopping has yet been done. The ore thus far produced has been obtained in the driving of drifts and sinking of shafts. Not a pound of ore has been broken unless it was a necessity to do so. From the first level a drift is now being driven due west for the purpose of obtaining air, and it is expected that an opening will be made in the course of the next few hours.

"The force of men is, at present, only twenty-three, and these miners have accomplished all this work within a space of only six weeks. The work of development has produced already 350 tons of good ore. The timbering is all of the most substantial character, the heaviest sticks being used and the work being done in the best style of the art. After an experience of eighteen years in mining and examining mines, we have rarely seen so large a body of good ore, so well-timbered a mine, or so well-regulated a mining outfit as the Glass mine."

THE GUNNISON.—A correspondent writing to the *Denver Tribune* of the 4th inst. says: "Crested Buttes is destined to be the great *entrepôt* for all this section of country. It is the center of the great coal region, and of lime-rock, iron, and other deposits needed for smelting; a company owning the coal mines confidently expects to make the anthracite coal available for smelting, and, if so, the future of Crested Buttes as a smelting point for the Gunnison country is assured. Crested Buttes is forty-three miles from Hillerton. So far, there have been found nothing but low-grade carbonates in that vicinity, but the coal deposits are immense, extending at least two and a half miles up Coal Creek and westward to an unexplored distance. Up Coal Creek there is a well-defined deposit of hematite of iron, and above this a ledge of lime-rock.

"Six miles beyond the Buttes we come to the Ruby camp, where the Forest Queen is located. This mine is situated in a small gulch, and was exposed by the wash of a small creek running through it. This mine showed a four-foot vein of ruby silver, assaying over \$1200 to the ton, and the supply promises to be inexhaustible. It was recently sold for \$100,000 to St. Louis parties. The extension of the Forest Queen is the Ruby King, a mine with a very promising showing. Further up the creek, there is the same exposure, and it is being rapidly taken up. About one half mile up Coal Creek are other newly-discovered mines, the first of which is the Lead Chief, bonded recently for \$100,000, showing some very handsome but not as high grade ore as any mine in the camp, with a four-foot crevice of wire silver corroded. It carries gangue rock in large quantities, and is consequently not so valuable on that account.

"Beyond is the Ruby Chief; all of these show ruby silver of high grade, and are only partially opened. In this vicinity there has been discovered a deposit, extending at least, four miles of coal, of anthracite formation. Over the divide is Independence Gulch, named from Independence mine, the largest in Ruby camp; croppings show for at least one and a half miles of valuable silver deposit. The ore from this mine is different in character from any thing in Ruby camp, showing sulphides and high-grade galena; assays of as high as 1500 ounces of silver, and eighty-four per cent of lead, have been obtained. East of this is Slate River, forty miles northwest of Hillerton, where there are at present no developed mines, but numerous prospects showing high-grade galena. The Little Cora, a few feet below the surface, shows assays of 400 ounces silver and seventy-three per cent lead and a four-foot vein. At the foot of Gothic Mountain is Gothic City, a village of 100 houses and encouraging prospects, where are a large number of mines running high-grade galena and wire silver. The Silver Knight is now worked with good results. At Gothic City, there is one unworked smelter, but half a dozen are now being built and will be operated in the spring, and will all be kept busy from the product of the numerous mines at that point.

"Our informant is strongly of the opinion that the whole of the Gunnison country and Indian reservation is fully as rich in mineral and other matters as the small portion he has described."

NEVADA.

THE COMSTOCK.—We extract from the *Gold Hill News* of December 31st as follows:

"Union Consolidated is opening up most satisfactorily. The ore-body extends into Sierra Nevada, carrying its high-grade ore with it, and the make of the clay, which borders it in an easterly direction, to the southeast, where it is cut by the east cross-cut in Union, while the western border, so far as known, holds a southerly trend, and shows a widening of the ore formation to the south. On the 2300 level, its reach is from the Union shaft to the Sierra Nevada stopes, and also above that level to the little cross-cut west below the 2100 level of the Sierra Nevada incline.

"Improvements exist in the drift south on the 2300 level of the Union as well as in the Union-Mexican cross-cut west on the 2000 level.

"The Hardy vein in Ophir continues to develop favorably on the 2100 level north from cross-cut No. 1, where a width of 42 feet is shown. It is also known that this vein runs at least nearly through the Mexican. The indications are, that it has already led to an ore-body on the 2100 level; and, since the reach north of the vein is as above, it strengthens the prospects of Mexican as well as Ophir. It is being approached also on the 2200 level of Ophir by the southeast drift.

"The station for the drift on the 2400 level which is to connect the Chollar-Norcross-Savage shaft with the Savage incline is completed, and the drift will soon be started. The Hale & Norcross is getting ready to sink a winze to the same level. The Savage incline is also to be pumped out and continued on down to the required depth to connect with the 2400 drift.

"The Bullion winze from the 2150 level continues to improve, while the shaft of the Yellow Jacket shows good indications of plunging into a bonanza before an additional 50 feet in depth is gained.

"The improvement in the Belcher cross-cut east on the 2760 level is encouraging. In itself, the stringer of quartz, from 2½ to 3 feet wide, with places of ore in it, does not amount to much; but as a prospect and an assurance of ore at that great depth, it is important.

"Overman has already started a cross-cut east on the 1900 level, just south of the Segregated Belcher south line.

"Alta and Justice are encountering good prospects."

THE OUTLOOK FOR 1880.—We condense from the *Sentinel* of Jan. 1st the following: "We are wont to consider the outlook of Nevada for 1880 exceedingly good. The extension of the Virginia & Truckee Railroad to Bodie will give new impetus to the splendid mining and agricultural interests of Esmeralda County. So, too, will the construction of the road recently projected from Wadsworth to Columbus open up a vast area of excellent mineral-bearing territory. The early completion of the Austin and Battle Mountain road means better times for Austin, and all that section of rich mining country lying to the south of it.

"We have good reports from Belmont, Tybo, and all the leading districts of Nye County. Belmont is shipping more bullion than at any time in the past three years. The amount will be greatly increased the ensuing season.

"In Lincoln County, Bristol District is especially promising. The Hillside and Day mines are rich in base ores, which yield a handsome profit. The Raymond & Ely and Meadow Valley mines, of Pioche, are known to be rich below the water-line. Time and energy will conquer the flood.

"More capital is being invested in the mines of White Pine County than at any previous date since the great crash of 1870. The several tunnel enterprises di-

rected against Treasure Hill will culminate the present season. Cherry Creek and Osceola are prosperous and growing.

"Tuscarora, Cornucopia, and the various districts in Northern Elko seem content with their several prospects. It is a rich section of the State, and bears evidence of permanency.

"The Paradise mines, in Humboldt County, are steadily improving. A number of properties in Humboldt are yielding profitable returns.

"Eureka never looked half so well as it does to-day. Our future is more than assured. The outlook is especially bright and cheering in every part of the district. All of the leading mines are showing as well as the most sanguine friend of the district could wish, while a large number of new mines are just beginning to take rank as reliable bullion producers. The Richmond has a year's ore in sight; the K K is opening a new bonanza; while dividends from the Eureka Consolidated are assured for a long time to come. Jackson and Phoenix also are looking well, the former paying expenses and carrying over a handsome surplus. The Albion, which will shortly resume operations, it is confidently believed will develop some immense ore-bodies on the western slope of Ruby Hill proper. Our several tunnel enterprises on Prospect Mountain are meeting with the most encouraging indications. The Silver Connor, in the same neighborhood, has recently cut a large deposit of gold-bearing ore, going as high as \$130 to the ton in gold alone. All in all, therefore, Eureka may be set down as the most promising and prosperous district in the State."

The *Leader* of December 27th says:

"Three furnaces are running at the Richmond. The contract for running 500 feet on the Bayard Taylor has been let. The Richmond Company has men at work reconstructing No. 1 crystallizer at the refinery, and increasing its capacity to 50 tons from 25, its present size. This will give it increased facilities, and it will now have two 50-ton and two 25-ton crystallizers. The sale of one fourth of the Williamsburg & Williamsburg, Nos. 1 and 2, belonging to the estate of Mr. A. Benedict, was made yesterday for \$2500. From a letter received from Bartlett District we learn that the 10-stamp mill at that place will probably have to close down very soon, on account of the deep snow and the impassable condition of the road from the mill to the mines. The mill has made a very successful run so far, and will, no doubt, be started again as soon as the snow disappears.

"The consolidation of the Albion and Uncle Sam mines has been effected, and the certificate was filed in San Francisco Saturday, under the name of the Albion Consolidated Mining Company. Capital stock, \$15,000,000. Term of incorporation, 47 years.

"There have been some important developments at the Bay State mine. In the southwest drift on the lower level, from the new shaft, the vein has been encountered coming in strongly. What makes the discovery more important is, that the ore is similar in character and kind to that found in the winze coming down from the tunnel. Some 30 tons are now on the dump, which will be shipped to the Richmond at once.

"The news is very encouraging from the Eureka tunnel. In the face of the tunnel, at a distance of some thirty feet from the side drift, a blast exposed some very fine ore, and it is coming in stronger as developments progress.

"Work is being vigorously prosecuted on the Silver Connor, with the most gratifying results. At the bottom of the shaft, 215 feet from the surface, the owners have eight feet of ore that will work \$100 per ton. They are taking into serious consideration a proposition of shipping 100 tons of fine ore to Salt Lake for reduction. There is every indication to justify the belief that this will soon be one of the largest producing properties in the district."

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 December 30th, 1879:

No. of Patent.	Title of Invention.	Name of Inventor.	Residence.
223,007	Crucible-Furnace	Edward P. Raichhelm	Jersey City, N. J.
223,035	Hoisting and Elevating Apparatus	Edwin S. Cunningham	Moorefield, W. Va.
223,068	Electrical Pressure Indicator	Thomas Shaw	Philadelphia, Pa.
223,084	Hydrocarbon-Burner	Francis M. Wareham	Oil City, Pa.
223,102	Ore-Separator	Cornelius Bennett	Silver City, N. Mex.
223,112	Meter for Measuring Electricity	Benjamin F. Card	Brooklyn, N. Y.
223,114	Machine for Tarring Wire Ropes	Richard Cotter	Virginia City, Nev.
223,132	Automatic Electric Switch for Telephones	Edwin T. Greenfield	New York City.
223,164	Stone-Sawing Machine	Alfred G. Osgood	Pittsburg, Mass.
223,201	Auxiliary Telephone-Exchange	G. Westinghouse, Jr.	Pittsburg, Pa.
223,202	Automatic Telephone-Switch for Connecting Local Lines by means of Main Lines	G. Westinghouse, Jr.	Pittsburg, Pa.
223,210	Solution for Depositing Nickel Alloy	William Frishmuth	Philadelphia, Pa.

- (a) Assignor to Benjamin F. Brundred, same place.
 (b) Assignor to himself and Daniel M. Adee, Brooklyn, N. Y.
 (c) Assignor to William B. Kimball, Enfield, Mass.

RE-ISSUE.

9,011—Coal-Washing Machine.....Sebastian Stutz.....Pittsburg, Pa.

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:

Removing Ledges from Channel of the Detroit River; G. Weitzel, Major of Engineers, U. S. A., 26 Washington avenue, Detroit, Mich.	Jan. 10, 1880
For Filling Depot Grounds; L. M. Johnson, General Manager, 520 Walnut street, St. Louis.	" 10, "
Improving Harbor of Brunswick, Georgia; S. F. Fremont, Assistant Engineer, Savannah, Ga.	" 12, "
Southern Yellow Pine and White Oak; W. A. Roebing, 21 Water street, Brooklyn.	" 12, "
Extending Sewer; William C. D. Witt, Department of City Works, Brooklyn.	" 12, "
For Furnishing Labor and Material for Repairs of the North and East Buildings inside Fort Columbus, at Governor's Island; Alex. J. Perry, Dep. Q. M. Gen., U. S. A., Governor's Island.	" 19, "
Sewers; Board of City Commissioners, Cincinnati, Ohio.	" 20, "
Bridge Builders and Contractors; E. W. Jarvis, City Bridge Engineer, Winnipeg, Manitoba.	" 21, "
Ice Harbor; Furnishing Stone for construction of a Lock in the Muskingum River; amount of stone 13,200 cubic yards; Wm. E. Merrill, U. S. E. office, 82 W. Third street, Cincinnati, O.	" 23, "
For the Construction of a Timber Trestle-Bridge over the Huron River; Henry C. Waldron, Sec., Ann Arbor, Mich.	" 24, "
Dredging—100,000 cubic yards, from the Channel through Maunee Bay; John M. Wilson, U. S. E. office, Cleveland, O.	" 27, "
Railroad Cars, for the Nicaragua Government; A. J. Cothéal, Consul General of Nicaragua, 62 W. Thirty-sixth street, New York City.	
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. 9.
For so early in the year there has been a very large business in mining stocks. In fact, the stocks at the Mining Exchange have never shown more satisfactory transactions. Prices have generally advanced, and the outlook is favorable to the rapid development of a very large interest in this class of investments. The improved condition of the San Francisco market has developed an active demand for these.

The Bodie stocks show a very fair business. Bodie records sales of 1450 shares at \$9 1/4 @ \$9. Standard has been somewhat quiet, but strong. The sales amount to 930 shares at \$28 1/2 @ \$30. Bechtel shows a very active business and considerable strength. The sales aggregate 4600 shares at \$1.55 @ \$2.05 @ \$1.85. Bulwer has had a liberal business, and has been steady at \$9 1/4 @ \$9 1/2. Consolidated Pacific records only 825 shares at \$4.90 @ \$5 1/2. There were no transactions in this stock yesterday nor to-day.

Goodshaw has been quite active but weak, declining from 50c. to 39c., selling to-day at 40c. On Tuesday, May Belle began to develop activity, and the sales since then have amounted to 5050 shares at 20 @ 26c. The North Standard farce has been continued, with sales of 600 shares at \$1.80 @ \$1.85. Tioga sold on Saturday at \$2.30, and to-day at \$2.75. Total sales for the week, 400 shares.

The old bonanzas have absorbed the bulk of the business in the Comstock mines. California records sales of 4330 shares at \$4.15 @ \$4.75 @ \$4.35 @ \$4.50. Consolidated Virginia shows a very large business, but considerable weakness. The sales aggregate 9580 shares at \$5 1/2 @ \$4.55. To-day, 100 shares of Crown Point sold at \$4. On Wednesday, 20 shares of Savage sold at \$9. Sierra Nevada has become a regular feature of the market. There were transactions each day of the past week although the sales only aggregate 335 shares. On Monday, \$29 was reached, and yesterday \$20 1/2, although there was a reaction to \$22 to-day. On Wednesday, 10 shares of Alta sold at \$4.25. Consolidated Imperial has been very active, and, at times, showed some strength, although the lowest point of the week was reached to-day. The sales aggregate 15,775 shares at 96 @ 76c. Yesterday 20 shares of Julia sold at \$3. The transactions in Leviathan were confined to to-day, and amounted to 400 shares at 25c.

The Tuscarora stocks are attracting very liberal attention and the quotations are looking better. Belle Isle records sales of 3115 shares at \$1.35 @ \$1.80. The sales of Grand Prize amount to 250 shares at \$1.20 @ \$1.50. Independence rose from \$1 on Saturday, to \$1.50 Wednesday, and fell back again to the first figure to-day. The sales aggregate 2885 shares. Martin White has ranged between \$1.25 and \$1.35, with sales of 400 shares. Navajo has been quite active, the sales amounting to 5200 shares at 35 @ 59 @ 45c. Tuscarora has been quite active and strong. The sales amount to 13,500 shares at 22 @ 32c.

The miscellaneous stocks show a moderate business in the aggregate, although some have been rather quiet. The sales of Eureka amount to 755 shares at \$16 @ \$17 1/2. On Saturday, 150 shares of Leeds sold at 50c. Caledonia (B. H.) has been very quiet, the sales amounting to but 400 shares at \$3.40 @ \$3. Tip Top has been quite active and very strong, advancing from \$2 on Saturday to \$3 to-day, with sales of 1805 shares.

The most important business, however, has been in the stocks on the regular lists of our local boards. Caribou has been fairly active, the sales amounting to 1470 shares at \$4 1/2 @ \$5 1/2, the latter figure being registered to-day. Excelsior has been very quiet and steady, the sales amounting to 250 shares, at \$25 @ 25 1/2. Findley has been liberally dealt in at irregular prices, although the highest point of the week was reached to-day. The sales amount to 6400 shares at 60 @ 67c. Great Eastern has been very active within the range of 43 @ 38 @ 41c. The sales aggregate 41,300 shares. Green Mountain has been very active, and alternately strong and weak. The sales amount to 14,775 shares at \$2.20 @ \$2.05 @ \$2.15. Homestake has been very quiet but steady, with sales of 210 shares at \$38. Hukill has been very active. The sales amount to 28,635 shares at \$3.95 @ \$4.55. There is nothing new from the mine, although it is expected that the vein will be struck on the third level in a day or two. Early in the week there was a

business of 1450 shares at \$5 1/2 @ \$5 1/4 in La Plata. Leadville has been fairly active and strong. The sales amount to 5298 shares at \$4.25 @ \$4.50, with dividend, and \$4 @ \$4.40 ex-dividend.

Little Pittsburg has been fairly active and strong, with sales of 2706 shares at \$29 1/4 @ \$30 1/2. Moose has had a good business at irregular prices. The sales amount to 6290 shares at \$2.85 @ \$3.05. The sales of New York & Colorado amount to 400 shares at \$2.35 @ \$2.25. Ontario only records 280 shares at \$39 1/4 @ \$39 1/2. Plumas has gained more activity and strength. The sales amount to 2100 shares at \$2.65 @ \$2.80. Climax has been fairly active, but shows some weakness to-day. The sales amount to 3540 shares at \$3 1/4 @ \$3 1/2.

The Mariposa stocks have shown a small business during the past two days. The sales of Preferred amount to 200 shares at \$3, and of Common, 450 at \$2.25 @ \$3. In the Quicksilver stocks, Preferred has been quiet, with sales of but 400 shares at \$62 @ \$62 1/2, while in Common the transactions amount to 1740 shares at \$20 @ \$21. Rappahanock sold up to 41c. on Tuesday, and down to 37c. yesterday, although recovering to 39c. to-day, with sales of 24,825 shares. Shamrock has shown considerable activity although a little weak. The sales amount to 4200 shares at \$1.45 @ \$1.30. South Hite has been very active, but weak. The sales aggregate 13,300 shares at \$3.50 @ \$3.15. Suro Tunnel has had liberal transactions, the sales amounting to 14,240 shares at \$4 1/2 @ \$3 1/4. In Trio, 100 shares sold to-day at 80c.

The dealings in the fancies have been as follows: Buckeye, 21,300 shares at 58 @ 54c.; Dahlonga, 14,500 at 22 @ 20c.; Gold Placer, 19,310 at 25 @ 30c.; Granville, 20,100 at 48 @ 43c.; Lacrosse, 59,650 at 46 @ 59c.; Lucerne, 13,300 at 21 @ 20c.

A telegram of January 5th, from the Superintendent of the Green Mountain Gold Mining Company to the president of the company says: "Grass chimney is turning out rich ore. The production for November is better than for any previous month. I will report same in a day or two."

Plumas National Gold Mining Company, of California, was, on Saturday, reorganized under the laws of the State of New York, stock unassessable, with the following directors: William H. Guion, President; Paul Lichtenstein, H. C. Bidwell, E. P. Burgess, H. W. Howell, Francis S. Brown; Henry J. Rogers, Secretary and Treasurer.

For several months past, great dissatisfaction has been expressed at the management of the Leadville Mining Company. This was not unlooked for by us, as we predicted it when the company was formed. At the annual meeting the following trustees were elected: J. B. Chaffee, S. B. Elkins, Henry Havemeyer, W. S. Nichols, L. M. Lawson, J. D. Smith, and T. W. Shannon. L. M. Lawson was elected President, and W. S. Nichols, Vice-President.

The Spring Valley Hydraulic Mining Company, the first enterprise put forward by the United States Mining Investment Company, will open its books for subscription to its stock some time next week. We shall give it further notice in a future issue.

The Deadwood Mining Company has a cash surplus of over \$200,000. The average monthly yield for the last eight months was \$37,817.73; average monthly expenses, \$10,236.32; leaving balance of \$27,581.41. An additional mill of 60 stamps will soon be put up. The mine is situated in the Black Hills, and is on the same vein as the Homestake, and under the same management.

The Deadwood Mining Company announces a dividend of 25c. per share for December, payable at Wells, Fargo & Co.'s on the 20th inst. The transfer-books will close on the 15th inst.

The Climax Mining Company has declared a dividend of 10c. per share, payable on the 15th inst. Transfer-books close to-morrow.

The Standard Consolidated Mining Company has declared a dividend of 50c. per share, payable January 12th.

The Horn-Silver Mining Company has declared a dividend of 25c. per share, payable on and after January 26th. The transfer-books will close January 21st and reopen January 27th.

The Ontario Silver Mining Company has declared, from the December earnings, a dividend of 50c. per share, this being the fifty-first dividend paid since the company was formed. This dividend will be paid at Wells, Fargo & Co.'s, on the 15th instant. The trans-

fer-books will close on the 10th instant. The production for 29 days in December was \$154,286.91.

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

NAME OF COMPANY	CLOSING QUOTATIONS.							Open- ing. Jan. 9.
	Jan. 2.	Jan. 3.	Jan. 5.	Jan. 6.	Jan. 7.	Jan. 8.	Jan. 9.	
Alpha.....	10	10 1/4	11 1/2	10 3/4	11 1/4	10	10	
Alta.....	3	3 1/4	4 1/4	3 3/4	4	4 1/2	4	
Argenta.....	1 1/2	1 1/2	1 1/4	1 1/2	1 1/2	1 1/2	1 1/4	
Bechtel.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
Belcher.....	7	6	5 1/2	5 1/2	5 1/2	6 1/2	5	
Belle Isle.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	
Belvidere.....	1	1	13-16	1	1	29-32	.....
Benton.....	.....	.....	.....	.....	.....	.....	.....
Best & Bel.....	11 1/2	13 1/2	13 1/2	13	13 1/4	13 1/2	13 1/4	
Black Hawk.....	.....	.....	19-32	1	1	21-32	.....
Bodie.....	9	9	9	9	8 7/8	9	.....
Booker.....	.....	.....	.....	.....	.....	.....	.....
Boston Con.....	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1.35	
Bullion.....	4 1/2	5	5	4 1/2	4 1/2	4 1/2	.....
Bulwer.....	9 1/2	9 1/4	9 1/2	9 1/2	9 1/4	9 1/2	.....
Caledonia.....	1 1/2	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2	.....
Cal. B. H.....	2 1/2	.....	.....	.....	.....	.....	.....
California.....	4 1/2	.....	.....	.....	.....	.....	.....
Chollar.....	6 1/2	8	7 1/4	7	7 1/4	7 3/4	7 1/4	
Confidence.....	.....	.....	.....	.....	.....	.....	.....
Con. Imp.....	1 1/2	21-32	19-32	1 1/2	9-16	13-32	17-32	
Con. Pacific.....	4 1/2	4 1/2	4 1/2	5	5	5	5	
Con. Va.....	4 1/2	5	4 1/2	4 1/2	4 1/2	4 1/2	4 1/2	
Crown P. Int.....	4 1/4	4 1/4	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	
Dudley.....	1 1/2	.....	.....	21-32	21-32	.....	.....
Endowment.....	.....	.....	.....	.....	.....	.....	.....
Eureka Con.....	16 1/4	.....	16 1/2	17	17 1/4	17 1/4	.....
Excelsior.....	3 1/4	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/4	
Goodshaw.....	5-32	5-16	5-16	11-32	5-16	13-32	.....
Gould & Cur.....	6	7	6 1/4	5 1/2	5 1/2	6	5 1/2	
Grand Prize.....	1 1/4	.....	1 1/4	1 1/4	1 1/4	1 1/4	.....
Hale & Nor.....	7 1/4	8 1/2	8 1/2	7 1/2	8 1/2	8 1/2	8 1/2	
Hamburg.....	.....	.....	.....	.....	.....	.....	.....
Homestake.....	.....	.....	.....	.....	.....	.....	.....
Hussey.....	.....	.....	.....	.....	.....	.....	.....
Indep'd nce.....	1	1 1/4	1 1/4	.....	.....	13-16	13-16
Jackson.....	3 1/4	.....	.....	.....	.....	3 1/4	.....
Julia Con.....	2	2 1/2	2 1/2	2	2 1/2	2 1/2	2 1/2	
Justice.....	2	2 1/4	2 1/2	2 1/2	2 1/2	2 1/4	2 1/4	
Kentuck.....	.....	.....	.....	.....	.....	.....	.....
Kossuth.....	.....	.....	.....	.....	.....	.....	.....
Lady Wash.....	9-16	19-32	27-32	11-16	11-16	19-32	.....
Leeds.....	1/2	.....	.....	.....	.....	.....	.....
Leopard.....	.....	.....	3-32	.....	.....	.....	.....
Leviathan.....	5-16	5-16	5-16	5-16	5-16	11-32	.....
Mammoth.....	1 1/4	1 1/4	2 1/2	3	3	3	.....
Manhattan.....	.....	.....	.....	1 1/4	.....	1 1/4	.....
Maybelle.....	.....	.....	.....	5-32	3-32	5-32	.....
Mar. White.....	19-32	21-32	21-32	21-32	3 1/2	21-32	.....
McClinton.....	7-16	.....	.....	7-16	7-16	7-16	.....
Meadow Val.....	.....	.....	.....	.....	.....	.....	.....
Mexican.....	20 1/4	22 1/4	20 3/4	19 1/2	19 3/4	20	19 1/2	
Mono.....	6	6 1/4	6 1/4	6 1/4	6 1/4	6	6 1/4	
Navajo.....	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4	.....
North Belle.....	6 1/2	6 1/2	6 1/2	7	8	8 1/2	.....
N. Belle Pe.....	.....	.....	.....	11-32	11-32	11-32	.....
N. Bonanza.....	9-16	1/2	1/2	1/2	1/2	.....	.....
N. Standard.....	.....	.....	.....	.....	.....	.....	2.15
Ophir.....	20 1/4	21 1/2	20	20 1/4	19 1/2	20 1/2	19 1/4	
Orig. Kys'e.....	.....	.....	.....	.....	.....	.....	3.10
Overman.....	8 1/4	8 1/2	8	8	8 1/2	7 1/2	.....
P. Sheridan.....	.....	.....	.....	.....	.....	.....	.....
Potosi.....	4 1/2	4 1/2	3 1/2	3 1/2	3 1/2	4 1/2	.....
Ray & Ely.....	1	.....	.....	29-32	29-32	3 1/4	.....
R. de Monte.....	1 1/4	.....	1 1/2	1 1/2	1 1/2	1 1/2	.....
Richer.....	.....	.....	.....	.....	.....	.....	.....
Scorpion.....	6 1/4	7 1/4	7 1/2	6 1/2	6 1/2	6 1/4	6 1/2	
Seg. Belcher.....	.....	.....	.....	.....	.....	.....	16
Sierra Nev.....	19 1/4	25 1/2	21 1/2	20 1/4	20 1/4	20 1/2	20 1/2	
Silver Hill.....	3 1/4	21-32	27-32	13-16	3 1/4	13-16	.....
Silver King.....	7	7	7 1/2	7 1/2	7 1/2	.....	.....
So. Bulwer.....	19-32	19-32	19-32	19-32	3 1/4	3 1/4	.....
Standard.....	.....	.....	.....	.....	.....	.....	.....
Summit.....	.....	.....	.....	.....	.....	.....	.....
Syndicate.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	.....
Tioga.....	.....	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4	.....
Tip Top.....	2	2 1/2	2 1/2	2 1/4	3	3 1/2	.....
Trojan.....	.....	.....	.....	.....	.....	5-16	.....
Tuscarora.....	.....	.....	.....	.....	.....	.....	.....
Union Con.....	42	49 1/2	44 1/2	42 1/4	44	46 1/2	46	
Utah.....	.....	.....	.....	.....	.....	.....	11 1/4
Wales.....	3 1/2	3 1/4	3 1/2	3	3 1/2	3	.....
Ward.....	.....	.....	.....	.....	.....	.....	.....
Washoe Con.....	.....	.....	.....	.....	.....	.....	.....
Yel. Jacket.....	11 1/2	12	11 1/4	10 1/2	11 1/4	11 1/2	10 1/2	

* Ex-Dividend.

REVIEW OF THE SAN FRANCISCO MARKET.

The prices of mining shares on the San Francisco market still indicate a better feeling. In many instances, an advance has occurred; to-day's quotations, however, in the majority of instances, open at a decline from the best figures of the week, yet the market, on the whole, fairly sustains the improvement noted a week ago. Regarding the influence of the new Constitution on stocks and stock operations, which went into effect on the 1st inst., a Pacific Coast contemporary observes:

"The stock brokers are taking active measures to protect themselves and their business from the effects of the constitutional clause which provides that all contracts for the sale of shares of any corporation or association on margin or to be delivered on a future day, shall be void, and that all money paid on such contracts may be recovered by writ. The customers of Greenebaum, Helbing & Co. have been notified to call at the office of the firm on important business, where a printed contract, which is said to virtually abrogate all the rights of the speculator, was submitted to them for signature, which was witnessed by one of the clerks. This remarkable document stipulates, that hereafter all purchases and sales are to be made for cash, the buyer depositing not less than 50 per cent of the purchase, and the balance of the money to be considered a cash loan on the part of the firm, for which interest is to be charged."

"The California Steam Navigation Company has reduced capital stock from \$500,000 to \$100,000. Another move

GENERAL MINING STOCKS.

Dividend Paying Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val), ASSESSMENTS (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 3, Jan 5, Jan 6, Jan 7, Jan 8, Jan 9), and SALES.

Non-Dividend Mines.

Table with columns: NAME AND LOCATION OF COMPANY, Feet on Vein, Capital Stock, SHARES (No., Par Val), ASSESSMENTS (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 3, Jan 5, Jan 6, Jan 7, Jan 8, Jan 9), and SALES.

Total Assessments levied to date.....\$59,811,780

Total Dividends paid to date.....

Total Shares sold during the week.....

* Gold, s. Silver, L. Lead, C. Copper.

Non-Assessable.

have decided to make their shafts deeper instead of continuing to produce ore from the present levels. We reduce the yield of some of the mines to correspond without latest information. We keep the rate of the Iron Mine at 50 tons, though Stevens & Leifer are not delivering any thing like this quantity, being unwilling to pay the current rates for treatment.

"The following table shows the operations of the smelters for the week ending December 27th :

Table with columns: Smelters produced, Tons of bullion, Silver, Value, Lead, Total, Bars of bullion on hand. Lists various smelters like Grant, Billing & Eilers, Oro La Plata, etc.

"Coke has declined \$7@8 per ton, and freights are \$1 lower. It is said that there are over 1500 teams on the road. Silver is unchanged. Rates for treatment have advanced considerably; very fair ores are going at \$28@30 per ton. The decline in freights to the end of the track has led to increased shipments of bullion, and the stock on hand is much reduced.

"The event of the week has been the sale of the Little Chief Mine to the Chrysolite Company, of New York, which was consummated yesterday. The price to the promoters was \$1,750,000, but the latest quotations of the stock show that a profit of about \$500,000 on paper has already been realized on the transaction. At the present rate of production, the mine should yield, under proper management, not less than \$1,000,000 net per annum. Mr. W. S. Keyes, manager of the Chrysolite combination, will have charge of the Little Chief."

Leadville freighting, and its cost during the year past may be appreciated by the following figures from the Colorado Springs Gazette in its annual review of business: from and at that place. The number of pounds transported to Leadville, via Colorado Springs, is stated to be 10,423,976. March, April, October, and December were the busiest months. May, June, July, and August the most slack. The price paid freighters (distance about 70 miles) ranged from 1 1/2 to 5 cents per pound. The total amount paid for this freighting could not have been less than \$300,000. A force of 443 mules and 110 men per month were needed. The average outfit make two trips per month. Four days are usually spent in Colorado Springs. It is estimated that the shoeing costs per month \$1172; the stabling of animals, \$1296; repairs on wagons, \$1000, and the board of men while in town, \$440. The freighters' outlay at this one point has probably been \$75,000 for the year past.

Pueblo (Colo.) has three blast-furnaces, four cupola furnaces, and two calcining, with twelve roasting kilns. The three blast-furnaces have a capacity for thirty tons of ore per day, and a production of half that figure in base bullion.

The Belle Isle Output.—The Tuscarora Times-Review says: "This Company commenced crushing ore from the mine about the middle of last June, since which time the following shipments of bullion, as shown by the books of Wells, Fargo & Co., have been made: June, \$50,769; July, 139,207; August, 92,131; September, 114,576; October, 71,039; November, 58,362. December, 20,367. Twenty-six weeks' run, \$546,457. Six dividends have been paid, aggregating, \$300,000."

Eureka Consolidated Shipments.—The Sentinel says: "During the year, the Eureka Consolidated shipped bullion as follows: Month. Pounds. Month. Pounds. January, 2,118,030; February, 2,314,030; March, 2,846,480; April, 2,044,425; May, 1,484,310; June, 1,697,700; July, 1,741,395; August, 1,816,010; September, 2,013,440; October, 1,890,917; November, 1,580,905; December, 1,113,168. Total, 22,570,870."

"Average monthly shipment, 1,880,905 pounds; average daily shipment, 61,838 pounds. This bullion contains from \$220 to \$230 per ton in gold and silver, and the lead has ranged from \$60 to \$100 per ton during the year."

A recent crushing of 200 tons of ore from the Eureka mine in the Palmyra (Como) District, Nevada, at the Wetter Pioneer mill, gave a result of 42 lbs. of amalgam, which is worth from eight to ten dollars per ounce. The Bodie Output for 1879.—From the Bodie Free Press of January 1st, 1880, we take the following: "The shipments from the Bodie District this year compare with those of 1878 as follows: 1878. 1879. January, \$111,567.97; February, 84,473.50; March, 78,449.77; April, 70,619.33; May, 62,026.15; June, 85,012.44; July, 110,075.79; August, 699,944.33; September, 317,020.63; October, 170,398.36; November, 124,020.69; December, 209,323.31; Shipment by banks, 39,000.00. Total, \$2,129,732.58. Total shipments in 1878, \$2,556,847.58. Increase this year over last, \$427,115.00."

"The following tables show the production of previous years, with the product of each company individually credited:

SHIPMENTS IN 1877. Standard, \$784,522.80; Mexican, Red Cloud, and Kate Rogers, 12,500.00; Total, \$797,022.80.

SHIPMENTS IN 1878. Standard, \$1,025,383.35; Bodie Consolidated, 1,042,236.80; Bechtel, 58,634.93; Red Cloud, 1,927.50; Scattering, 1,550.00; Total, \$2,129,732.58.

SHIPMENTS IN 1879. Standard Consolidated, \$1,448,845.47; Bodie Consolidated, 764,067.12; Bulwer Consolidated, 241,094.38; Noonday, 36,532.29; Syndicate, 12,316.38; Betch-l Consolidated, 11,506.85; Sitting Bull, 3,485.09; Shipment by banks, 39,000.00; Total, \$2,556,847.58.

"The percentage of gold and silver in the production of 1879 is shown by the following table: Mines. Gold. Silver. Standard Consolidated, 92, 8; Bodie Consolidated, 85, 15; Bulwer, 92, 8; Noonday, 70, 30; Sitting Bull, 90, 10; Syndicate, 93, 7."

The Gilpin County (Colo.) Bullion Product for 1879.—The Central City Register-Call of December 31st publishes the following table, showing the shipments of gold from Central City in 1879: January, \$113,250; February, 84,750; March, 92,750; April, 104,936; May, 114,800; June, 96,360; July, \$117,050; August, 104,650; September, 93,100; October, 109,350; November, 110,500; December, 110,350; Total through the express, \$1,251,836.

The total production of the several veins on Silver Mountain, Gilpin County, Colo., for 1879, is estimated at \$80,000. The production of Gilpin County for eight years was as under: 1872, \$1,389,289; 1873, 1,530,000; 1874, 1,631,863; 1875, 1,763,985; 1876, \$2,240,000; 1877, 2,203,037; 1878, 2,257,000; 1879, 2,358,836.

Exports of Gold and Silver from New York. Week ending January 3d, \$3,820; Corresponding week last year, 143,743; Since January 1st, 1879, 14,264,142; Corresponding period 1878-79, 12,108,093.

Gold Interest paid out by the Treasury. Week ending January 3d, \$7,524,268; Corresponding week last year, 7,761,587; Since January 1st this year, 2,311,885; Corresponding period last year, 2,948,634.

Silver Bullion Purchases.—WASHINGTON, Jan. 2, 1880.—The Treasury Department announces a purchase of 150,000 ounces of silver for the Philadelphia Mint.

WASHINGTON, Jan. 8.—At the weekly opening of offers for the sale of silver bullion for the standard silver dollar coinage to-day, the Treasury Department accepted 440,000 ounces, of which it is understood 100,000 ounces are for delivery at the New Orleans Mint, between 200,000 and 300,000 for the Philadelphia Mint, and the balance for San Francisco. It is stated at the Department that no difficulty is experienced in keeping an ample supply of silver at the Philadelphia Mint, but that considerable embarrassment is had in keeping both the New Orleans and San Francisco mints supplied. The purchase of silver bullion during the calendar year just ended averaged a fraction over \$2,000,000 worth per month.

The Gold Flood During 1879.—The Commercial Bulletin says: "The importations of specie for the week ending January 2d amount to \$407,977, including \$8090 gold and \$399,907 silver. The weekly returns make a total of \$84,260,495 for the entire year 1879, as against \$19,150,973 reported officially for 1878. The largest total any previous year was \$37,088,413, reached in 1861, and next to that was \$26,217,888 in 1876. From August 1st, 1879, to January 2d, 1880, the importations reach \$78,003,839, consisting of \$74,802,814 gold, and \$3,141,025 silver, as follows: \$39,189,028 foreign gold coin, \$28,629,910 gold bullion, \$14,953,562 American gold coin, \$112,358 gold dust, \$1,316,023 American silver coin (including trade dollars), \$1,566,888 foreign silver coin, and \$35,469 silver bullion. Of the total since August 1st, 1879, \$45,874,354 was received from the Continent, \$25,963,981 from Great Britain, and \$6,165,504 from West Indies and South America."

Philadelphia Mint Coinage.—The following is the statement of the coinage executed at the United States Mint, in Philadelphia, during the year 1879, as prepared by the superintendent:

Table with columns: Denomination, Number of pieces, Value. Lists Double-eagles, Eagles, Half-Eagles, Three dollars, Quarter-eagles, Dollars, Total gold, Standard dollars, Half-dollars, Quarter-dollars, Dimes, Total silver, Five cents, Three cents, One cent, Total base, Grand total.

December Mint Coinages.—The following is a statement of the coinage executed at the United States Mints during the month of December, 1879:

of the coinage executed at the United States Mints during the month of December, 1879:

Table with columns: Gold, Number of pieces, Value. Lists Double-eagles, Eagles, Half-eagles, Three dollars, Quarter-eagles, One dollar, Total gold, Silver, Dollars, Half-dollars, Quarter-dollars, Dimes, Total silver, Minor Coinage, Five cents, Three cents, Cents, Total minor coins, Total coinage.

Salt Lake Ore and Metal Market.—The Inter-Ocean's correspondent, under date of December 22d, writes from Salt Lake City as follows: "The shipments of ore, lead, bullion, and copper matte for the week ending December 20th were as follows: Cars. Bullion to Pittsburg, 5; Bullion to Omaha, 3; Bullion to Chicago, 6; Ore to Omaha, 2; Copper matte to San Francisco, 5; Lead to New York, 4; Total, 25 Pounds. Bullion, 293,496; Ore, 42,000; Lead, 87,671; Copper, 107,800; Total, 530,967."

"Our market is dull, and some of the cañon roads are blocked up with snow. Bullion, nominally \$62 per ton for lead, and \$1.10 per ounce for silver."

METALS.

NEW YORK, Friday Evening, Jan. 9. It looks as though the "boom" had started in metals already. The business has been very fair and promises to develop very rapidly, with indications of a strong advance in nearly every article.

Copper.—There is a larger demand for this article. The spot sales probably aggregate 400,000 lbs. at 21 1/2 @ 21 1/4 c., and, for February, March, and April delivery, at 22c. At the close, the market is strong at 21 1/2 on spot, and, for futures, 22 1/4 @ 22 1/2 c., with a strong upward tendency. It has been impossible to get at the statistics of this article; but they are believed to make a favorable showing, and, with the largely increased consumption, a very favorable year is expected.

Tin.—The sales reported amount to 300 tons on spot and to arrive, at 22 1/2 c. on spot and to 22 1/4 c. to arrive. The closing quotations are: Straits, on spot, at 22 1/2 c.; and to arrive, 22 1/4 @ 22 3/4 c.; L. & F. 21 1/4 c.; Refined, 22c. Mr. E. P. White, metal broker, of 55 Fulton street, furnishes the following statistics:

ESTIMATE OF SUPPLY OF TIN TO UNITED STATES FROM ALL SOURCES, DIRECT AND INDIRECT, DURING 1879, IN TONS OF 2240 LBS. January 1st, 1879: Stock in first hands of dealers and speculators, in New York and Boston, 700; Straits tin afloat by steamer, direct, 372; via London, 585; sailing vessel, 60; Total shipment from Penang and Singapore, sail and steam direct, and via London, arrived in the United States up to December 31st, 1879, 5,285; Indirect importations, Straits and Australian from Great Britain, imported via London, 600; Australian tin, imported via London, 727; Billiton and Banca from and via Holland, 28,800; slabs, 920; Imports of English tin, of all kinds, 1,400; Consumption during 1879, 9,000.

January 1st, 1880: Stock in first hands, dealers and speculators, 1,722. The following quantities of tin are now afloat from Penang and Singapore: Bal. of Oct. shipment, by sail, 150 tons; by steam, 220 tons; Nov., 550; All of Dec., 375; Total tons, 2,195.

At the present rate of consumption, 12,000 tons should be reached this year.

Tin Plates.—There has been a very large business during the week, and at the close it is impossible to name prices. They are at least 50 @ 75c. higher than a week ago.

Lead.—Sales of about 3000 tons at 5 1/2 @ 5 3/4 c. are reported for the week. At the close 5 1/4 c. is asked, and there is a strong upward tendency. It is estimated that the consumption exceeded the production in 1879, and that it is likely to do so in 1880. The receipts of lead at St. Louis, by the St. Louis

& San Francisco Railroad, during the week ending December 31st, amounted to 210 tons.

Spelter and Zinc.—Spelter is quiet, but much firmer. We quote at 6 1/2 c. Sheet zinc is quoted at 8 3/4 c., with a good jobbing business.

Antimony.—There is a fair business and active inquiry. We quote Cookson's at 19 1/2 @ 20c.; Hallett's, 17c.; and Johnson & Mathy's at 16 1/2 @ 16 3/4 c.

Quicksilver.—The San Francisco Commercial Herald of January 1st says:

"The market continues without animation at 38 1/2 @ 40c. The City of Tokio, hence for China and Japan on the 27th ult., did not carry a single flask. A contemporary has this to say: 'Prices are entirely nominal. Buyers might possibly be found at or about 38c. per lb., though there is no inquiry worth noting at this time. The London market, according to the last private advices shown us, was down to 46 10s. per flask. In this connection, a shipment of 250 flasks from New York to Liverpool on the 2d inst., is rather significant, especially as relates to the condition of the former market. Such shipments are of very rare occurrence, and 'like sending coals to Newcastle.' We hear of an offer to lay down a lot of Quicksilver in New York at a lower figure than quoted for this market by some holders.' Receipts for the week, 1132 flasks."

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan. 9.

American Pig.—The market for this article, like that for all other classes of iron, is experiencing the wildest kind of excitement. It is having a "boom" never before experienced, and the most conservative are prepared for almost any advance. The fact is, that it will be impossible to meet the demand at reasonable prices. Prices are going to go so high as to actually curtail the demand. We note sales of 500 tons Allentown, No. 1, at \$34; 500 tons No. 1 Thomas at \$35, and 250 at \$40; 500 tons No. 1 Crane at \$39 1/2; 1000 tons Chestnut Hill Forge, and 500 tons Thomas, at \$35; also 2000 tons of No. 2 Thomas at \$35. It is impossible to give correct quotations. Nominally, however, they are: No. 1 Foundry at \$40 @ \$36; No. 2, \$35 @ \$36; and Forge, \$33 @ \$35.

Scotch Pig.—The Glasgow market is up from 5s. to 7s. 6d. per ton. This, in connection with the higher prices of American and the large demand, has advanced prices here. We quote Gartsherrie at \$33.50; Coltness, \$35; Glengarnock \$32.50; Summerlee, \$35.50 @ \$34; and Eglinton, \$32. Prices still have a strong upward tendency. It is a strange condition of affairs to see American iron selling at a higher price than Scotch.

Rails.—The business in these is limited by the inability of the companies to take orders for delivery in any thing like reasonable time. We note sales of 10,000 tons of steel at \$77.50 at mills, and 5000 tons on private terms. We learn of no business in American iron, for which it is difficult to make a quotation. Foreign rails were offered to-day at a price equal to about \$55 here. Prices both here and abroad have a strong upward tendency. For steel rails \$100 per ton is predicted.

Old Rails.—Sales of about 30,000 tons are reported at about \$41 for D. H.'s, and \$39.50 for T's. The market has a strong upward tendency with indications that the stocks of the world will soon be exhausted.

Wrought Scrap.—This is active and firmer. We note sales of 500 tons of No. 1, ex ship, at \$36, and 200 at \$37.50 from yard. We quote at \$38.50 @ \$38.75.

We publish the following letters, received from our regular correspondents:

"The new year opens with an active demand for pig-iron, and further advance in prices. We quote to-day as follows:
Balt. Char. ... \$46 00 @ \$48.00 M. & White ... \$31.00 @ \$32.00 Va. ... 46 00 @ 48.00 C.I.C. Blooms 85.00 @ 90.00 Anth. No. 1 ... 34.00 @ 35.00 " Billets 87.00 @ 90.00 " " 33.00 @ 34.00 Ref'd Blooms 70.00 @ 75.00 " " 32.00 @ 34.00

"R. C. HOFFMANN & Co."
"LOUISVILLE, KY., Jan. 5.
"The market has been very active, and shows an advance of from \$3 to \$5 per ton during the last ten days. We revise quotations accordingly:

FOUNDRY IRON. Table with columns for No. 1 and No. 2, listing items like Hanging Rock Charcoal, Southern Charcoal, H'n'g Rock, Steel & Coke, Southern Stonecoal & Coke, Amer. Scotch, and Scotch Iron with their respective prices.

MILL IRONS. Table with columns for No. 1 and No. 2, listing items like No. 1 Charcoal, Cold-short & Neutral, No. 1 Steel & Coke, Cold-short & Neutral, No. 2 Steel & Coke, Cold-short & Neutral, No. 1 Missouri and Indiana, Red-short, and White & Mottled, Cold-short & Neutral.

CAR-WHEEL AND MALLEABLE IRONS. Table listing Hanging Rock, Cold Blast; Alabama and Georgia, Cold Blast; and Kentucky, Cold Blast with prices.

"GEORGE H. HULL & Co."
"PITTSBURG, PA., Jan. 6.

"There has been an exceedingly active market during the past week, accompanied by a decided advance in prices. At this time, the market is very strong, with an upward tendency, and holders are very firm in their views. The recent advance in manufactured iron has, of course, done much to strengthen the raw material. Quotations are:

Table listing No. 1 F'dry, No. 2, No. 1 Mill, Bessemer, and other iron products with prices.

"A. H. CHILDS."
"RICHMOND, VA., Jan. 5.

"The receipts of pig and scrap iron of all grades for the past week have been heavy, exceeding 1400 tons. This iron has all gone into consumption. About 200 tons of Scotch and 100 tons charcoal pig-iron are embraced in the sales. Quotations are firm as scheduled below:

Table listing various iron products like Scotch pig-iron, Amer. Scotch Pig-Iron, Anthracite, Va. Cold Blast Charcoal Pig-Iron, Old Rails, Wrought Scrap, Machinery, Richmond Refined Bar Iron, Horse shoes, Mule shoes, and Old Dominion nails.

"ASA SNYDER."
"ST. LOUIS, Jan. 3.

"The week past has shown no abatement in demand, nor any increase in supply, and though higher figures have been asked and paid than our last week's quotations, we think best to continue them. Every department of the iron business is buoyant, and prospects were never better for a large and profitable trade.

CHARCOAL HOT BLAST. Table listing Missouri, Southern, and Hanging Rock with prices.

COKE AND COAL. Table listing Missouri, Southern, Ohio River, Jackson County, Hocking Valley, and Mill irons.

COLD BLAST. Table listing Missouri, Southern, and Ohio with prices.

IRON ORE. Table listing Iron Mountain, Southwest, and Ore for flux.

OLD RAILS AND CAR WHEELS. Table listing Rails and Wheels.

THE COAL TRADE REVIEW.

NEW YORK, Friday Evening, Jan. 9.

Anthracite.

The market for anthracite coal is in a very demoralized condition, so far as the tide-water markets are concerned. The great cause of this is, however, the very mild weather we have had and are having. Should the winter continue as it has been, there would be a difference of several million tons in the consumption. Retailers are doing but very little, stocks are accumulating in first hands without any indication that there will be a further curtailment of production, and all classes of buyers are holding off as much as possible with the belief that lower prices will rule, and from present indications they are right, provided they do not wait for too low prices, as is frequently the case.

At the present time, we do not learn of the companies offering large concessions, but at the same time we find that they are doing comparatively no business at the prices they are trying to maintain. There is considerable coal offered by the individual operators and dealers at low prices. The large companies are generally of the opinion that there will be a demand for all the coal that can be mined in 1880. That may be, but, for the time being, such is not the case, and unless a change takes place in the weather it is not likely to be for two or three months. If the companies can find stocking ground for their coal and will then stock it until the demand improves, their present production may be warranted, but otherwise there is likely to be a competition before the opening of navigation that will bring with it very low prices.

Our Philadelphia correspondent writes as follows, under date of January 8th:

"The mild weather has very much demoralized the coal trade. The anticipations of high prices have also been beyond measure, and it is to be feared that the eagerness to get a high price will prevent realizing as much for coal as would be obtained if the prices were regulated according to what the demand actually is. High prices in the spring mean purchases delayed to the latter part of the season by many, and a dull spring and summer with an excited fall trade and a short period of high figures. A fair price all through the shipping season yields far better in the end than great and sudden changes. There is very little shipping being done at Port Richmond. Large vessels offering at \$2 for Boston. The river is entirely free from ice. The South is well stocked with coal."

Bituminous.

There is still a fair amount of orders to be filled, but new orders are becoming more scarce, while the Pennsylvania Railroad is offering the Clearfield operators a more liberal supply of cars, and freights from Baltimore are easier. The indications favor lower prices for bituminous coal.

Messrs. C. A. Miltenberger & Co., of New Orleans, La., send us the following statement of coal in the New Orleans market on January 1st:

"Coal on hand: Pittsburg coal, 6 boats, 1 barge, and 3 barges of nut coal; St. Bernard coal, 6 boats. Consumption during December: Pittsburg coal, 17 boats, 7 barges, and 3 barges of nut coal, and 32,000 barrels of sunken coal that has been raised. Arrivals during December: 10 boats and 8 barges (5 of nut) of Pittsburg coal."

Messrs. R. P. Elmore & Co., under date of Milwaukee, Wis., January 6th, write as follows:

"Please make the following the retail quotations on coal at this place:

Table listing retail prices for Lehigh prepared chippings, Lump, Lackawanna prepared, Brier Hill, Cannel coal, and Steam coals.

SAN FRANCISCO, CAL., JAN. 1.

COAL.—Imports from January 1st to October 1st:

Table listing coal imports from various sources like Anthracite, Australian, Coos Bay, Carbondale, Carmel Bay, etc.

The late coal weather has been the occasion of an extraordinary demand for household coals, particularly those of Seattle, Wellington, and Coos Bay. These Pacific coals go far toward supplanting the West Hartley and other choice descriptions of foreign. Anthracite, other than Lehigh, finds but few purchasers on this coast other than for foundry use. Our local mills, factories, etc., and the inland steamers use California Mt. Diablo largely, also the Seattle and Wellington Screenings. These sell at low figures, say \$4 @ \$4.50 per ton for all screenings. The steamship and railroad companies have yearly contracts for Kanaimo and Seattle Coals, as heretofore noted. The spot market is without life or animation. Imports during the week include the following: Per Juno, from Sydney, 2000 tons; Revere, 1150 tons Wellington; Montana, 1000 tons do.; El Dorado, 1705 tons Seattle; Arcata, 340 tons, and the Laura May, 360 tons Coos Bay. The 2000 tons Sydney, per Juno, goes direct to the rolling mills on orders.—Commercial Herald.

New York.

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

Large table showing wholesale prices of anthracite coal delivery f.o.b. at tide water shipping ports, per ton of 2240 lbs. Columns include coal type (Lump, Steamer, Grate, Egg, Stove, Chestnut) and price.

* 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.

Wholesale Prices of Bituminous Coal.

DOMESTIC GAS COALS.		
Per ton of 2240 lbs.	At the Shipping Ports.	Along-side at New York.
Westmoreland and Penn.	\$4.25	\$5.50
At Greenwich, Philadelphia		5.50
At S. Amboy	5.00	5.40
Kanawha at Richmond	4.10	5.85
Murphy Run, West Va., at Baltimore	3.75	5.70
Fairmount, West Va., " " "	3.75	6.00
Newburg Orrel, Md., " " "	3.75	10.00
Cannelton & Peytona Cannel, West Va.		7.00
" Splint " at Richmond	6.00	5.65
" Gas Coal at Richmond	4.00	

MANUFACTURING AND STEAM COALS.		
Cumberland at G'n & Alexandria	3.00	5.50
Cumberland, at Baltimore	3.25	5.50
Cl'r'd' Eureka" and "Franklin."		
At mines	1.25	
At Baltimore	3.25	5.25
At Philadelphia	3.50	
At South Amboy	4.85	

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	25s.	7.50

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 three days ending Dec. 31st, and years from January 1st:

TONS OF 2240 LBS.	1880.		1879.	
	3 days.	Year.	3 days.	Year.
Wyoming Region.				
D. & H. Canal Co.	15,681		9,659	
D. L. & W. RR. Co.	21,859		30,137	
Penn. Coal Co.	*		8,095	
L. V. RR. Co.	7,354		3,632	
P. & N. Y. RR. Co.	88		248	
C. RR. of N. J.	*		*	
	44,982		51,771	
Lehigh Region.				
L. V. RR. Co.	17,172		12,400	
C. RR. of N. J.	*		*	
D. H. & W. B. RR.	*		*	
	17,172		12,400	
Schuylkill Region.				
P. & R. RR. Co.	8,587		38,916	
Shamokin & Lykens Val.	*		*	
	8,587		38,916	
Sullivan Region.				
Sul. & Erie RR. Co.	416		867	
Total	71,157		103,594	
Increase				
Decrease				
Total same time in 1875		19,441,136 tons.		
" " " " 1876		18,105,339 "		
" " " " 1877		20,134,739 "		
" " " " 1878		17,127,681 "		
" " " " 1879		25,725,724 "		

* These reports were not received this week.

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.

The increase in shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Pennsylvania railroads, amounts to 49,482 tons, as compared with the corresponding period in 1878.

Belvidere Delaware Railroad Report for nine days, and years ending Dec. 31st:

	Nine days.	Year. 1879.	Year. 1878.
Coal for shipment at Coal Port (Trenton)	103	35,902	14,233
Coal for shipment at South Amboy	11,025	502,367	430,578
Coal for distribution	5,469	344,827	199,656
Coal for Company's use	2,200	96,770	84,332

The Production of Bituminous Coal for the nine days ending Dec. 31st as follows:

Tons of 2000 lbs., unless otherwise designated.		
	Nine days.	Year.
Cumberland Region, Md.		
Tons of 2240 lb.	57,884	1,702,993
Barclay Region, Pa.		
Barclay RR., tons of 2,240 lbs.	11,467	343,891
Broad Top Region, Pa.		
Huntingdon & Broad Top RR.	4,758	141,594
*East Broad Top	1,190	63,069
Clearfield Region, Pa.		
*Snow Shoe	1,552	54,253
*Tyrona and Clearfield	41,862	1,561,476
Alleghany Region, Pa.		
*Pennsylvania RR.	5,982	202,720
Pittsburg Region, Pa.		
*West Penn RR.	4,568	211,305
*Southwest Penn. RR.	930	42,133
*Penn. & Westmoreland gas coal, Pa. RR.		
	22,286	787,408
*Pennsylvania RR.	14,403	538,557

* For the week ending Dec. 21st.

The Production of Coke for the week ending Dec. 31st:

Tons of 2000 lbs.	Week	Year.
Penn. R.R. (Alleghany Region)	1,253	49,199
West Penn. RR.	1,781	93,279
Southwest Penn. RR.	14,689	886,581
Penn. & Westmoreland Region, Pa. RR.	2,522	93,801
Pittsburg, Penn. RR.	16,321	275,547
Total	38,566	1,398,407

FREIGHTS.

Rates of Freight on Anthracite Coal on the Philadelphia & Reading Railroad and its Branches.

SCHUYLKILL COALS.	Per ton of 2240 lbs.		
	From Pine Grove.	From Tamaqua.	From Schuylkill Haven.
To Port Richmond, via P. & R. R. R., Main Line, for shipment	2.10	2.05	1.90
To Harrisburg, via Lebanon Valley Branch	1.37	1.98	1.83
To Allentown, via East Pennsylvania Branch	1.09	1.64	1.49
To Lancaster, and Points on Lancaster Branch, via R. & C. R. R.	1.80	1.75	1.60
To Dauphin, via Schuylkill and Susquehanna Branch	1.20	1.61	1.43
To Statedale Junction, via Berks and Lehigh ranch	1.86	1.81	1.66
To Lebanon, via Lebanon and Tremont Branch	1.02		

From Tamaqua to Catawissa, McAuley, Mainville, Rupert and Danville, via Catawissa & Williamsport Branch Railroad \$1.00
From Tamaqua to Williamsport, Hall's and Montoursville, via Catawissa & Williamsport Branch Railroad \$1.35

* For shipment via Main Road (except to Port Richmond and Elizabethport for shipment) one and one-half cents per ton per mile, and two cents per ton additional to Schuylkill Haven, Pine Grove, or Tamaqua, as the case may be. Provided no charge shall be less than 15 cents, or greater than 45 cents per ton.

† Coal sent to points on the Catawissa and Williamsport branch will be charged one and one-half cents per ton per mile, and two cents per ton additional to Tamaqua. No separate charge for freight and tolls for coal consigned to Port Richmond and Elizabethport for shipment will be made for the laterals; but there will be collected on all such coal upon the laterals, on account of the entire through charge to Port Richmond and Elizabethport: 25 cents at Schuylkill Haven, 10 cents at Tamaqua, and 5 cents at Pine Grove.

An additional charge of 25 cents per ton will be made on chestnut and pea coal to whatever points consigned. If the shipper signs a release of all demands arising from a deficiency of weight at the place of destination, and agrees to indemnify the company from all claims by reason thereof, such additional charge will not be made. Releases, properly prepared, will be furnished, and can be signed at the coal offices of the company, at St. Clair, Palo Alto, Schuylkill Haven, Mount Carbon, Pine Grove, and Tamaqua.

For consumption at local points in coal region, including Shamokin, Herndon, Schuylkill Haven, Pine Grove, and Tamaqua, three cents per ton per mile, and two cents per ton additional; and a charge for car service of fifteen cents per ton to individuals and five cents per ton to manufacturers, when in Philadelphia & Reading Railroad cars, provided no charge, including freight tolls and car service, shall be less than twenty-five cents per ton.

Coal sent westward via Northern Central Railway (in N. C. R. W. Co.'s cars, three cents per ton per mile, from collieries west of Locust Summit to Locust Gap, or Shamokin, provided no charge shall be less than five cents or more than fifteen cents per ton. If from collieries east of Locust Summit, ten cents per ton extra.

One mile extra will be added for coal passing through the East Mahanoy Tunnel.

Fractions of distances and rates will always be stated in tenths.

No charge will be made for weighing or making returns of coal shipped, and the latter will be furnished free of charge upon application to the weighmaster; if these returns are to be sent by mail, envelopes properly stamped and addressed must be furnished to the weighmaster.

All coal will be charged the rates (both lateral and main line) current on the day it is weighed; it will also be weighed on the same day.

The following circulars are all dated January 2d:

Circular No. 2.—1880.
All drawback circulars issued during 1879, in reference to drawbacks on anthracite coal shipped either from Port Richmond or via Schuylkill Canal are hereby withdrawn, and the rates and drawbacks named therein discontinued.

Circular No. 3.—1880.
On and after January 5th, 1880, and until further notice, such drawbacks will be paid upon all anthracite coal shipped from Port Richmond and consigned to points beyond the Capes of the Delaware, upon or through the Delaware & Raritan Canal, and through the Chesapeake & Delaware Canal, as will reduce the freight and tolls from the mines to 42½ per cent of the net price at which the coal is sold f. o. b. at Port Richmond for lump, steamer, broken, egg, stove, and chestnut coal, and 72½ per cent for pea coal. Provided, That the minimum rate from mines to Port Richmond shall not be less than \$1.00 on lump, steamer, and stove coal, and \$1.40 on all other sizes, and provided that no higher rate of freight than then current in company's boats shall be deducted from the price at which the coal was sold in New York harbor to find the f. o. b. price at Port Richmond.

If consigned to points within the Capes of the Delaware, a drawback of 30 cents per ton will be paid.

The above drawbacks will only be paid upon strict compliance, in all details, with the rules and regulations pertaining thereto, issued by the secretary of the company.

Circular No. 4.—1880.

On and after Monday, January 5th, 1880, and until further notice, such drawbacks will be paid upon all anthracite coal shipped from Elizabethport as will reduce the freight and tolls from the mines to 48 per cent of the net price at which the coal is sold f. o. b. at Elizabethport, for lump, steamer, broken, and egg coal, 46 per cent for stove and chestnut coal, and 72½ per cent for pea coal. Provided, That the minimum rate from mines to Elizabethport shall not be less than \$1.95 on lump, steamer, and stove coal, and \$1.75 on all other sizes.

The above drawbacks will only be paid upon strict compliance in all details with the rules and regulations pertaining thereto, issued by the secretary of the company.

Circular No. 5.—1880.

On and after January 5th, 1880, a charge of fifteen cents per ton will be made for shipping anthracite coal at Port Richmond and Elizabethport, and the pea and dust will be retained by the company.

Circular No. 6.—1880.

On and after January 5th, 1880, and until further notice, the maximum net rate of freight and tolls on lump and steamboat coal actually consumed in the process of making iron from ore at any blast-furnace situated on the lines of the railroads of this company, including the Reading & Columbia Railroad, will not be over \$1.40 per ton of 2240 lbs. from Schuylkill Haven, \$1.55 from Tamaqua, and \$1.60 from Pine Grove.

Circular No. 16.

On and after January 5th, 1880, and until further notice, the rates of freight and tolls on anthracite coal to Elizabethport, per ton of 2240 pounds, in company's cars, will be as follows:

From Schuylkill Haven	\$2.50
" Tamaqua	2.65
" Pine Grove	2.70

The charges on the laterals on above coal will be the same as those on anthracite coal to Port Richmond for shipment.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to Jan. 8th, 1880.

Ports.	From Philadelphia.	From Baltimore.	From Elizabethport, Port Jervis, Shamokin and Westhaver.
Alexandria			
Annapolis			
Apponaug			1.00
Baltimore			
Bangor			
Bath, Me.			
Beverly			
Boston, Mass.		2.50	1.45@1.50
Braintree			
Bridgeport, Conn.			
Burlington			
Cambridge, Mass.			
Cambridgeport			
Camden			
Charleston			
Charlestown			
City Point			
Coosaw, S. C.			
Damariscotta			
E. Boston			
East Cambridge			
E. Greenwich, R. I.			80
Fall River			
Georgetown			
Hackensack			
Hartford			
Hingham			
Keypoint			
Lambertville			
Lynn			
Marblehead			
Medford			
Milville			
Milton			
Mystic River			
New Bedford		2.25	90
Newburyport			
New Haven		1.50	
New London			
Newport			80
New York		2.00	
Norfolk, Va.			
Norwich		1.40	
Norwalk, Conn.		1.40	
Pawtucket			
Plymouth			
Portland		2.55	
Portsmouth, Va.			
Portsmouth, N.H.		2.00	
Providence		2.25	
Provincetown			
Quincy Point			
Richmond, Va.			
Rockland			
Rockport			
Roxbury			
Saco			
Sag Harbor			
Salem, Mass.			
Saugus			
Savannah			
Somerset			
Staten Island			
Trenton			
Troy			
Wareham			
Washington			
Weymouth			
Wilmington, N. Y.			
Wilmington, Del.			
Wilmington, N.C.			

* And discharging. † And discharging and towing. ‡ 3c. per bridge extra. § Alongside. ¶ And towing up and down. * And towing.

DIVIDENDS.

OFFICE OF THE DEADWOOD MINING COMPANY, No. 31 BROAD STREET, New York, January 9, 1880.

DIVIDEND NO. 1.

A dividend of TWENTY-FIVE CENTS per share for December will be paid at the office of Wells, Fargo & Co., Transfer Agents, 65 Broadway, on the 20th inst. Transfer-books close on the 15th inst.

H. B. PARSONS, Assistant Secretary.

OFFICE OF THE ONTARIO SILVER MINING COMPANY,

DIVIDEND NO. 51.

The regular monthly dividend of FIFTY CENTS per share has been declared for December, payable at the office of Wells, Fargo & Co., Transfer-Agents, 65 Broadway, on the 15th inst.

H. B. PARSONS, Assistant Secretary.

HORN-SILVER MINING Co. OF UTAH, Office, 44 Wall st., New York.

DIVIDEND NO. 2. The Board of Directors have declared a DIVIDEND of \$100,000 (ONE HUNDRED THOUSAND DOLLARS), being twenty-five cents per share (par value, \$25) on the capital stock of the company, payable at the office of the company on and after JANUARY 26th.

CHARLES G. FRANCKLYN, President.

MEETING.

PHILADELPHIA & READING RAILROAD COMPANY. GENERAL OFFICE, 227 SOUTH FOURTH STREET. PHILADELPHIA, Dec. 16, 1879.

NOTICE IS HEREBY GIVEN TO THE Stockholders of this Company, that the Annual Meeting and Election for President, six Managers, Treasurer, and Secretary will take place at Musical Fund Hall, Locust street, above Eighth, on the second Monday, 12th of January next, at 12 M.

DAVID J. BROWN, Secretary.

ELKO CONSOLIDATED MINING AND SMELTING COMPANY, OF ELKO, NEVADA.

OFFICE, 152 BROADWAY, Room 2, second floor. 100,000 shares, \$10 each, organized under laws of State of New York; no incumbrances; vein 2300 feet in length; tested by 10 shafts and 5 tunnels; furnace, etc., complete. Ready for active operations. Stock can be purchased at office of the company at \$3 per share.

WM. W. WAKEMAN, President. C. DIMON, Vice-President. GEO. H. EVERETT, Secretary and Treasurer.

FINANCIAL.

VAN DEVENTER & PATTON, Successors to LUDLOW PATTON & Co., Bankers and Brokers, NO. 6 WALL STREET, NEW YORK.

C. H. VAN DEVENTER, WILLIAM LUDLOW PATTON. Stocks, Bonds, Gold and Government Securities Bought and Sold on Commission. Loans negotiated. Interest allowed on deposits. Dividends and Interest Warrants collected and remitted.

B. B. MINOR, J. M. HARPER, MINOR & HARPER, DEALERS AND BROKERS IN

MINING SHARES AND MINING PROPERTIES

Special attention given to the Stocks of the BODIE AND BLACK HILLS DISTRICTS. Office, No. 43 Exchange Place, New York.

Care Dickinson Bros., Bankers. Circulars sent on application, showing operation in Bodie and Black Hill Stocks.

PARKER HANDY, J. S. CRONISE.

HANDY & CRONISE, BANKERS,

AND DEALERS IN Bullion and Specie,

24 NASSAU ST., NEW YORK.

Dealing exclusively in GOLD AND SILVER BULLION AND COINS of all kinds. We are prepared to guarantee satisfaction to those who may intrust their business to us. We will make special arrangements with BANKERS and others dealing in GOLD DUST or in GOLD OR SILVER BARS, and will pay over to their correspondents here, as we may be directed, advances on Bullion when received or when the proceeds are ascertained.

We refer to: American Exchange N. Bank, The Third National Bank, Winslow, Lanier & Co., Eugene Kelly & Co., Eugene S. Ballin & Co.

COLORADO CENTRAL RAILROAD.

The only line for Central Idaho Springs, Georgetown, Boulder, Longmont, Golden, and the famous resorts and Parks of Colorado. Trains leave depot, foot of Sixteenth Street, Denver, at 7:00 A. M. and at 6:10 and 8:15 P. M.

O. H. HENRY, W. N. BABCOCK, Supt., Golden. Gen. Freight & Pass. Agent, Golden.

THE BRIGGS'S

CONSOLIDATED GOLD MINING COMPANY

BLACK HAWK, NEAR CENTRAL CITY, GILPIN COUNTY, COLORADO.

The Mine is now being Operated on a Dividend-Paying Basis. Machinery and Appurtenances complete and in thorough condition.

CAPITAL, \$2,000,000. SHARES, 200,000, \$10 EACH.

OFFICERS: President, CHARLES PLACE; Vice President, JAMES M. MOTLEY; Treasurer, JOSEPH POOL. TRUSTEES: JORDAN L. MOTT, Mott Iron Works, CHARLES PLACE, Mutual Gas Co.; JAMES M. MOTLEY; JOSEPH POOL, President Manufacturers and Mer. Bank; THEO. W. MORRIS, Importer of Glass Plate; Hon. BENJ. A. WILLIS, Lawyer; FERDINAND F. EARLE, Proprietor of Earle's Hotel; Secretary, JOHN H. KING. OFFICE OF COMPANY: DREXEL BUILDING, Room 55, corner Wall and Broad streets, New York. A limited number of shares for sale by JAMISON SMITH & COTTING, 14 Broad street.

Horn - Silver Mining Co., OF FRISCO, UTAH.

Office, 44 Wall Street, New York. Capital, \$10,000,000; 400,000 Shares; Par, \$25.

CHARLES G. FRANCKLYN, Pres.; ALLEN G. BROWN, Vice-Pres.; WILLIAM S. HOYT, Sec.; A. BYRAM, M. CULLEN, D. RYAN.

C. H. SMITH, STOCK BROKER, No. 15 Congress Street, Boston.

Special attention given to buying and selling mining shares in Boston market. ORDERS RESPECTFULLY SOLICITED.

HENRY F. GILLIG & CO., American Bankers and Agents, 449 STRAND, LONDON, ENG. New York Agents—DONNELL, LAWSON & CO.

W. W. HANLY & CO., BANKERS AND BROKERS, 60 Broadway, New York. Buy and sell mining stocks on commission on New York Mining Stock Exchange, and offer superior facilities on San Francisco Exchanges through agency of the Bank of California.

ADVERTISERS' INDEX.

Table listing various categories such as Air Compressors, Attorneys and Counselors, Bankers and Brokers, Belting and Rubber, Carbon (Black Diamonds), Blasting Powder, Blowers, Boilers, Boller Tubes, and Steam and Water Pipes, Books and Periodicals, Chemicals, Copper Dealers, Crushers, Ore, Dividends, Emery Wheels, Engineers and Chemists, Engineers' Instruments, Financial, Fire Brick, Food, Hoisting Machinery, Metal Brokers, Mining Companies, Mining, Milling, and Smelting Machinery, Photography, Pumps, Purchasing Agent, Railroads and Transportation, Rock Drills, Steel Works, Special Notices, Stoves, Tackle Blocks, Valves, Water-Wheels, Wire Rope.

Table listing various categories such as Air Compressors, Attorneys and Counselors, Bankers and Brokers, Belting and Rubber, Carbon (Black Diamonds), Blasting Powder, Blowers, Boilers, Boller Tubes, and Steam and Water Pipes, Books and Periodicals, Chemicals, Copper Dealers, Crushers, Ore, Dividends, Emery Wheels, Engineers and Chemists, Engineers' Instruments, Financial, Fire Brick, Food, Hoisting Machinery, Metal Brokers, Mining Companies, Mining, Milling, and Smelting Machinery, Photography, Pumps, Purchasing Agent, Railroads and Transportation, Rock Drills, Steel Works, Special Notices, Stoves, Tackle Blocks, Valves, Water-Wheels, Wire Rope.

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