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CONTENTS.

EDITORIALS :	PAGE.		PAGE.
The Lehigh Valley Railroad .....	175	Diseases of Miners .....	182
The Dudley Debate.—I.....	175	NOTES :	
Tying up the Tappansee .....	175	Explosion in a Powder-Mill.....	177
Microscopic Examination of Com- mercial Arsenic .....	176	Breaking out from a Mountain.....	177
The Panther Consolidated.....	176	Heavy Damage at Rosita, Colo.....	180
On the Weight, Fall, and Speed of Stamps.....	177	Hot Water in Coal Mines.....	182
The Cedral Mines, Coahuila, Mexico.....	177	GENERAL MINING NEWS :	
Alma District, Park County, Colo.....	178	Arizona.....	182
Pima County (Arizona) Mines.....	178	California.....	182
The Production of Bessemer Steel in the United States in 1880.....	179	Colorado.....	182
A New Departure in the Silver Mill.....	179	Montana.....	183
Chemical and Metallurgical Considera- tions on Lead Smelting.....	180	Nevada.....	183
Asphyxiation by Carbonic Acid, and Intoxication by Carbonic Oxide .....	181	Utah.....	183
PROGRESS IN SCIENCE AND THE ARTS :		PROPOSALS AND SALES.....	183
Timber Seasoning and Preserving... 179		FINANCIAL :	
Conversion of Bar-Iron into Steel by the Cementation Process.....	182	Gold and Silver Stocks.....	184
Photography as an Aid to the Study of Geology.....	182	Copper Stocks.....	186
		Coal Stocks .....	186
		BULLION MARKET.....	187
		METALS .....	188
		IRON MARKET REVIEW.....	188
		COAL TRADE REVIEW.....	189
		FREIGHTS.....	190
		STATISTICS OF COAL PRODUCTION.....	190

THE increase of the quarterly dividend of the Lehigh Valley Railroad Company from 1 per cent to 1½ per cent, is an evidence of the prosperity of the coal-carrying railroads.

THE DUDLEY DEBATE.—I.

A correspondent of the *Railroad Gazette* complains of the tone of a part of the Philadelphia discussion of Dr. DUDLEY's paper on steel rails. He came a long distance to get wisdom, and was considerably disturbed and disgusted to hear so much laughing. He thinks "it was the aim of some of the papers written on steel rails from the producer's stand-point to detract from the usefulness of one written from that of the consumer by insinuating and, in one case, undignified language." And he returned with the feeling that his time "had not been well spent in listening to a discussion, much of which added little or nothing to previous information, did not appear to be upon the merits of the question, and was very little to the points at issue."

We are sorry for this gentleman; but we venture to assure him that if he will wait until the full debate is published, and will then give his mind, undisturbed by the laughter of the frivolous, to the study of the various speeches and papers, he will find that, to a very remarkable extent, they were pertinent and forcible.

On the other hand, the *Iron Age* profoundly opines that the chemists received a lesson in this debate which they will not soon forget, and proceeds to urge a number of very sensible but wholly unnecessary arguments, by way of showing that, after all, the chemists should not be wholly despised.

As a matter of fact, the chemical work of Dr. DUDLEY was not seriously impugned at Philadelphia. Dr. DUDLEY's paper mentioned that certain determinations had been made by his assistants, for whose accuracy he was ready to vouch. The suggestion that these determinations should be made again, which was thrown out, not very earnestly, by one speaker, and the humorous stories told by others, of the errors that certain alleged chemists had committed, did not amount to a very severe arraignment. The comments made upon the absence of determinations of sulphur and copper in Dr. DUDLEY's analyses were pertinent; but we think it would not be difficult to show that they had less determining weight in the argument than their authors imagined.

Still less can it be said that chemists in general were greatly damaged. Whenever Brother HUNT or Brother JONES, or some other manager, tells one of those stories about some chemist's blunder, it is noteworthy that it is always "our chemist" who detected the thing. Every man of them believes in his own chemist; and their scorn, if they have any, is for somebody else's chemist.

In a matter of such importance, it would be perfectly proper, and not at all insulting to science, for any one who might feel inclined, to have the Altoona analyses repeated. But it will not be done, simply because confidence in Dr. DUDLEY's methods, and in the work done by his hand or under his eye, is universal.

Nor did he or his cause suffer any from the citation of anomalies against him. There are certain rails known to the trade, which are likely to become famous. One from Harrisburg (the coppery one), one from Troy, and so on, turn up as illustrations, to prove that nobody can prove any thing. Great chunks of them are sometimes laboriously carried to Institute meetings and thrown into the debates, like the chunk of new red sandstone in the Society of the Stanislaus. But they are not as weighty as they look; and against the evidence of corroborative coincidences in such great series of similar analyses as Dr. DUDLEY's two papers present, the testimony of these vagabond pieces of metal is idle.

It was not at all as a chemist that Dr. DUDLEY suffered even a shadow of defeat. In that capacity his papers reflect much glory upon him, which the conflict has not dimmed. And we predict that, whatever becomes of his deductions, the work he has done and the data he has furnished will remain of high and recognized value.

But as a mathematician, we fear the dauntless champion must confess overthrow. Several of the speakers expressed their dissatisfaction with his method of averages, though they did not seem to know very clearly what was the matter with it. Mr. KENT went further, and applied to it, graphically and otherwise, the *reductio ad absurdum*. If we understand Mr. KENT, however, he seems to conclude that no mathematical treatment of Dr. DUDLEY's results will make them prove any thing. A more careful perusal of the full report may correct our impression; but if it is as we now suppose, we beg leave respectfully to dissent.

The proof that the softer rails give the better wear, seems to us complete and overwhelming, in spite of Dr. DUDLEY's mathematical method, which obscures rather than enforces it. We shall show hereafter that his comparison "under all conditions" is really more favorable to the softer rails than he makes it to be.

The specifications and tests proposed by Dr. DUDLEY have also been criticised with considerable effect. It is, for instance, a perfectly proper reply to his "phosphorus unit" formula, that manganese has an important function besides that of a "hardener," and that good steel can not, for physical reasons, be uniformly made in the converter with the percentages of manganese and carbon which he requires. Mr. SELLERS, moreover, is right in saying that a specification which fixes all the chemical ingredients should not also fix all the physical properties. The manufacturer should be held to the physical tests, and then allowed leeway on at least one of the chemical ingredients (say carbon), so as to secure the physical properties required.

So much for an introductory survey of some of the points involved in the recent debate. We shall return to the subject. Meanwhile, however, we run no risk in notifying the rail-makers that chemistry has not left the field; that, sooner or later, the best composition of rail for given conditions will be ascertained, and that then they will have to submit. It will even be useless for them long to take refuge behind the assertion that certain percentages, not good for the rail, must be retained because they are good for the ingot. When our Bessemer manufacturers have the wit to adopt the basic process, they will find, as has been abundantly shown abroad, that by that process good ingots of any desired constitution can be made.

TYING UP THE TAPPANZEE.

Mr. JOHN B. HANSLER has printed a small brochure, entitled "A Plan for the Improvement of Navigation in the Harbor of New York during the Winter Season," which certainly merits attention. The money-value of the damage and loss of time caused every year in these waters, from Port Morris to Elizabethport and from Yonkers to the Narrows, by the accumulation of ice-blocks and floes, sailing in and out with the tide, is great enough to warrant considerable expenditure in the way of remedy, if remedy be possible. Hitherto, however, this evil seems to have been considered to be philosophically, as it has been only too literally, a part of "the Environment" of New York, and the Environment, as every Darwinian knows, is the modern name for Fate. Hence the meek submission with which ship-masters and dock-owners and ferry-passengers and Captain WILLIAMS shrug their shoulders, while the Hudson burlesques Behring's Straits, and the harbor, Baffin's Bay.

But Mr. HANSLER proposes to "take up arms against this sea of troubles, and by opposing end them." His argument is simple. In the first place, where does the drift-ice come from? The ice-fields which used to enter the harbor through the Kill von Kull from Newark Bay have not been heard from since the building of the New Jersey Central bridge—a most significant fact, since it not only simplifies the problem, but indicates the method for its complete solution. That bridge prevents at every ebb the passage of the ice from the upper Newark Bay, the Passaic, and the Hackensack. In like manner, a log-boom or bunches of spring spiles

would easily hold in place the relatively small quantity of ice found on the Jersey flats from Communipaw to Constable Hook. There is hardly any formed in the harbor proper. Staten Island Sound freezes early and remains frozen. Long Island Sound can send no considerable masses through the tortuous channel of Hellgate. It is the Tappansee and Haverstraw Bay, the wide shallows of which, with an ice-producing area of some seventy-five square miles, and a slow current, nearly fresh at low tide, that produce in cold weather a crop of ice every few days, to be carried into the harbor by wind and tide. Says Mr. HANSLER:

"It is the North River that sends down hundreds and thousands of acres almost every ebb-tide, which blocks up every thing; what gets broken up by the ferry-boats, the wind and current drive into the slips and between piers, choking them up; the ebb-tide, as it comes down North River, meets the flood-tide in the East River, by which the ice is carried on up, blocks up every nook and corner here, fills Wallabout Bay and Canal and Newtown Creek, so on up the channels on each side of Blackwell's Island, on one side as far as Harlem, on the other down to Port Morris, or as far as it can get, when the ebb-tide brings it back over the same course again, packing every thing as tight as herrings in a box. What the East River don't absorb is carried down to Gowanus Bay and Canal. The balance, by the time it gets as far down as the Narrows, the incoming flood drives on up the bay again, probably taking some of it up through the Kill von Kull, up by Port Johnston and Elizabethport, the harbor of which I have often seen choked up with North River ice. In fact, I have observed fields of ice making the route from Thirty-fourth street, North River, down to the Battery, up and down East River, as far down as the Narrows, and back again, three times, before it was all broken up and carried out in the ocean."

Mr. HANSLER'S proposed remedy consists in confining the ice of the Tappansee during the winter by means of cable-netting, stretched across the river at the narrows below, and attached to solid anchorages on each bank. This obstruction would be removed when navigation began, and Tappansee would be, as it now is, opened by the warm ocean currents, rotting the ice from six to fifteen days before it disappears at Albany. Without quoting at length the answers which Mr. HANSLER makes to possible objections, and the incidental advantages (ice-yachting, horse-racing, etc., on the permanent solid winter surface above the boom) which he points out, we call attention to his modest request that all persons who feel sufficiently interested in the subject and impressed by his plan to desire that the government make the necessary surveys and investigations to test its feasibility, should communicate with him, in care of J. P. AMES, 140 Broad street, New York City.

If it be true, as he believes, that the cost of the structures proposed would not exceed the damage now frequently suffered in a single season, the matter is certainly well worth serious attention.

#### MICROSCOPIC EXAMINATION OF COMMERCIAL ARSENIC.

We have received a copy of an interesting little pamphlet on the above subject, embodying the practical results to which the examination of the samples leads. It was prepared last year for the *Criminal Law Magazine* by EDWARD S. DANA, Ph.D., but by preference the publishers, Messrs. F. D. LINN & Co., of Jersey City, issued it in separate form.\* The question of the possibility of distinguishing between samples of arsenic from different sources by means of the microscope was first raised by a criminal trial, the *State vs. Hayden*, in Connecticut. Of the two kinds of white arsenic, or arsenious oxide, well recognized in chemistry, one is a white transparent crystalline solid, occurring in crystals which belong to the isometric or regular system, the commonest form being the octahedron, specific gravity, 3.69. The other kind is an amorphous substance, transparent and glass-like, when freshly made, but changing gradually on exposure to a white mass, looking like porcelain. This change begins at the surface and extends gradually to the interior; it is believed to be the result of a molecular alteration from the amorphous to the crystalline condition. The specific gravity is 3.74, and it is slightly more soluble in water than the first-described variety.

"Whenever white arsenic, of either kind, is volatilized by heat, or when a substance containing metallic arsenic is heated in contact with the air, so that the vapor of white arsenic is produced, this vapor will, on cooling, condense to the solid form, and usually to the crystalline variety, yielding in most cases brilliant and perfect octahedral crystals. If, however, the temperature of the surface on which the condensation takes place is above a certain point, or if the condensation goes on under pressure, then the amorphous or glass arsenic is produced."

The author goes on to the method of manufacture as described, for example, at length in *Watts's Dictionary of Chemistry* and in *Ure's Dictionary of the Arts*, and from his first preliminary examination with the microscope concludes that the material did not correspond to what his previous knowledge led him to expect, namely, that the white arsenic of commerce consisted of minute formless grains, but he found that, on the contrary, a very large proportion of the whole was in the form of perfect octahedral crystals. The author then goes on to say:

"It will be evident that, in order to explain the differences between samples of arsenic revealed by the microscope, the conditions of manufacture should be known as fully as possible. With this object in view, I visited the prominent arsenic manufactories in England—the Devon Great Consols mine, near Tavistock, Devonshire, and the Garland Works, at Biscoe, near Truro, Cornwall.

"I will state here the results of my observations.

"The white arsenic manufactured in England is obtained mostly from the

mineral arsenopyrite, also called mispickel, or arsenical iron, which is associated with the ores of tin and copper. One of the essential steps in the treatment of these ores, from which the useful metals are to be obtained, is the process of roasting. This consists, as is well understood, in the subjection of the pulverized ore, freed from gangue by washing, to a high temperature, commonly in a reverberatory furnace. By this means, the arsenic and sulphur, in combination with the metals, go off in vapor, as arsenious and sulphurous oxides, and the arsenious oxide is condensed in a series of chambers or flues. Thus each mine where the ores are roasted, has its arsenic flues in which the white arsenic is obtained in greater or less quantities, and in varying grades of impurity, according to the character of the ore. The condensed product, taken at intervals from the chambers, is the *crude arsenic*, also called arsenic flour, or arsenical soot ('Gifmehl' of the Germans). It varies in color from light gray to black, according to the amount of impurity present, and in all cases must be refined before it is fit for the market. This is sometimes done at the same works, as at Tavistock, but more generally it is sold to the refiner, who thus obtains his crude arsenic by purchase merely. It should also be added that, in the former case, ores which are of value only for the arsenic they contain are roasted for this.

"The crude arsenic is refined by introducing it into another furnace, or series of furnaces, where it is again volatilized by the heat. When it condenses in the long series of chambers through which the vapors are carried, it is, if the process is fully successful, in the form of a perfectly white crystalline solid, which needs only to be ground and packed in kegs to be made ready for the market.

"The unground arsenic is, as stated, all in the *crystalline* condition, the temperature of the chambers being too low to allow of the formation of the glass variety. I should add, however, that at some localities, at the Garland Works, for example, the glass arsenic is also made, as a special product, in the manner alluded to on an earlier page. This glass arsenic is put on the market in the lump form, where it commands a higher price than the common kind. It is in demand for various purposes in the arts, and, as remarked later, is subsequently ground and sold to druggists, in cases where an article of known purity is required."

The general features of arsenic, microscopically examined, and the general conclusions arrived at, based on the comparison of ninety-two samples, four of which were regarded as test-samples, and were studied with great minuteness, are then treated of.

The ninety-two kinds of arsenic were separated into seven groups. The basis of classification was the relative proportion in number of crystals to lumps. Plates, magnified 200 diameters, show the different forms of crystallization as seen in the field of the microscope. The author then describes in somewhat greater detail the general character of the samples falling under the seven groups into which the ninety-two samples were divided. Group No. 1 gave a percentage of crystals equal to 95, from which, in a decreasing order, Group No. 7 reached 0.

Special comparison of samples A and B are made, to which particular attention was devoted. A falls in Group III., and B falls in Group V.

The amount required for examination to insure a safe conclusion, and the nature of the conclusions which may be reached in any case, together with a short description of the method of examination, are treated of. Over three pages are devoted to the examination of the constancy in microscopic characters of a given lot of arsenic. This, and the question, "Has the arsenic of a given manufactory a distinctive character?" are answered as follows:

"The conclusion can hardly be given more strongly than this: That it may possibly be true that the arsenic of a given works is approximately constant in character, hence giving rise to a more or less constant difference between the product from two manufactories, as between the product at Tavistock and Biscoe (Garland).

"On the contrary, it is not impossible that the apparent agreement in the samples from the two sources named, so far as it goes, is *accidental* only, and that, consequently, the arsenic of a given works may vary between as wide limits as those of Group II. and V., or even I. and VI. This does not, however, militate in the slightest degree with the more important conclusion reached before—that the outcome of a given time is sensibly constant, and hence that, in many cases, the microscope is a sure method of deciding the question as to the difference of source for two test-samples."

A description of the examination of arsenic obtained from a stomach after death closes the subject, and the general results of the examination are summed up as follows:

"The study of a large number of independent samples of commercial white arsenic confirms the conclusion based upon the observations as to the method of manufacture, and shows that wide variations in character often exist. These differences, when they occur, are readily distinguishable by the microscope, and in almost every case it is by this means possible to conclude, of two test-samples, whether they *could* or *could not* have come from the same source; and this is true, under favorable conditions, even if one of the samples has been subjected for some time to the action of the stomach."

#### THE PANTHER CONSOLIDATED.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: My attention has been called to the prospectus of the Panther Consolidated Gold and Silver Mining Company, of Maricopa County, Arizona.

As I am well acquainted with the property referred to, a few words may be of value to any of your readers who propose to invest in the stock.

The so-called mine is in Cave Creek District, forty miles north of Phoenix, and as yet no work has been done on the location, notwithstanding the following statement from the prospectus:

"The work that has been done demonstrates that the Panther mine is one of the richest and finest prospects in Arizona." On the next page of the prospectus, the following assays are given:

No. 1, taken from the surface croppings, silver, 66½ ounces; gold, trace. No. 2, taken sixty-four feet below the surface, silver, 1072½ ounces; gold, 9-16 ounce.

The last assay could not have been made of a sample from Panther ground, as there is no shaft on the location.

I have been over the ground and could see no ledge—nothing but "float," and that barren, and a few small stringers of quartz in the slate, and do not hesitate to say that, even as a prospect, the Panther is, in my judgment, worthless.

PHOENIX, ARIZ., Feb. 25.

\* *Microscopic Examination of Samples of Commercial Arsenic, and the Practical Result to which it Leads.* By Edward S. Dana, Ph.D. Jersey City, N. J.: F. D. Linn & Co. 1880. Pamphlet, 8vo, 36 pages; 6 illustrations. Price, 50 cents.

ON THE WEIGHT, FALL, AND SPEED OF STAMPS.\*

By Adjunct Professor H. S. Munroe, E.M., Ph.D., School of Mines, New York City.

An elaborate discussion under this heading formed a chapter in one of the reports made by Professor Raymond as Commissioner of Mining Statistics.† In a subsequent report‡ was printed a paper, by Mr. William Main, Jr., of Columbia, S. C., containing a theoretical investigation into the effect of the velocity of impact on the effective duty of stamps.

A visit to the Lake Superior copper region last summer suggested an inquiry into the relative efficiency and economy of the enormous steam stamps of the copper-mills, as compared with the results obtained with the cam and tappet stamps commonly used in the West. The atmospheric stamp used at the Phoenix Mill promised to add interest to the inquiry, as giving an example of unusually high speed, this stamp making 150 drops per minute.

In introducing his subject, Dr. Raymond makes the following remarks, which are quite apropos of the present investigation:

"In considering the economical application of stamping machinery, we meet, at the beginning, with serious difficulties in obtaining accurate data for comparison. The weight and fall of stamps vary as the shoes and dies wear out; and this may lead to a change of speed also. Moreover, defects in engines, boilers, or machinery for the transmission of power may occasion serious losses, which can not fairly be charged to the arrangements of the stamps proper. Again, the capacity of stamp-mills is directly dependent, in some degree, upon the nature and extent of discharge, fineness of screens, and other peculiarities of the battery. Finally, the hardness and tenacity of the rock crushed vary so much that comparisons between different localities can not be implicitly trusted. The safest experiments are those made in the same mill by changing first one and then another condition of working; but this is seldom possible for such conditions as weight and lift of stamps, and only within narrow limits for their speed.

"We may eliminate questions of friction, transmission, and generation of power, in the case of stamps, by measuring the power actually developed by their fall. Thus the weight, multiplied into the fall in feet, and the number of drops per minute, gives us exactly the number of foot-pounds exerted by each stamp. Dividing by 33,000, the number of foot-pounds per minute in one horse-power, we have the horse-power per stamp, from which the effective power of the whole may be obtained. Dividing the amount of rock crushed daily by the effective horse-power gives us the daily amount per horse-power; and this is the best measure that can be obtained for the effectiveness of the stamps. A complete discussion of the subject would require us to determine the exact influence of the discharge, etc., and the exact resistance offered by different classes of rocks, for both of which points the data are wanting."

Dr. Raymond then gives a number of tables comparing a large number of stamp-mills in Colorado and California, giving the weight, fall, and speed of the stamps, and the tons crushed per horse-power developed, and concludes the paper with arguments in favor of high speed for stamp batteries.

In Mr. Main's paper, the author draws an argument in favor of a high drop, or great velocity of impact, from the velocity with which vibrations are transmitted through rock. The greater the velocity of the stamp, the quicker it will come to rest; and the less time and opportunity there will be for the vibrations to be transmitted through the rock into the mortar and the foundations of the battery. In the case of a 400-pound stamp with a 15-inch fall, the vibrations would extend through seven inches of granite before the stamp comes to rest. A 100-pound stamp with four times the fall (or the equivalent of this fall in the form of acceleration by springs or steam-power), the same number of foot-pounds being exerted, the vibrations would extend but 3½ inches into the rock. Or if we suppose the rock to be crushed to be 3½ inches thick, in the first case half the force has passed through the block and into the anvil, and in the second case the whole power of the blow is confined to the rock.

While Mr. Main's argument is well founded as regards the crushing of solid blocks of ore, it does not altogether apply to the crushing of the broken material. Vibrations will not be transmitted through

a mass of broken rock with the same speed as they will pass through solid granite; and in practice it may even prove of advantage that a portion of the force should be transmitted through the upper layer of fragments, in order that those below may be crushed.

EFFECT OF WEIGHT AND FALL OF STAMPS.—In order to determine the effect of weight, fall, and speed on the crushing capacity of a stamp, we must eliminate as far as possible other conditions having influence on the result. By taking for comparison stamp-mills crushing gold ores, we may secure a certain uniformity in these conditions, namely, similarity of material crushed, gold ore being usually quartzose; and, within a narrow range, equal fineness of crushing, very fine screens being uniformly employed. Silver-mills and gold-mills crushing cement have been excluded from this preliminary discussion; the first for the reason that silver ores of different localities are much less uniform in character than gold ores, and the latter because the coarse screens used increase largely the capacity of the stamps.

To simplify the discussion, weight and lift may be combined and expressed as foot-pounds. In order to eliminate the effect of speed, that is, the varying number of blows per minute, we may calculate and compare the pounds of ore crushed per single blow of the stamp.

The result of such a comparison is shown in the accompanying diagram, embodying the data from the report of the Commissioner of Mining Statistics for 1870, from nearly 100 California stamp-mills treating gold ores.

It will at once be seen from the above diagram that, although there is considerable variation in the amount crushed by stamps of equal foot-pounds, yet there is evidently a decided increase of effect with the heavier blows.

(TO BE CONTINUED.)

THE CEDRAL MINES, COAHUILA, MEXICO.

W. H. ADAMS, writing from the Cedral mines, Villa de Musquiz, Coahuila, Mexico, under date of February 15th, says:

Am working low-grade mixed sulphides, oxides, and carbonates of lead, running about 30 ounces per ton, and producing 200 ounces bullion. The plant is very crude, having been erected many years ago, but intended by me as experimental only, for future operations on a large scale. The mines are something wonderful to examine, and practically can never be exhausted. I should estimate from chambers we are able to examine, and those only visible, that the Mexicans for two hundred years past must have taken out over half a million tons from one mountain-side, and yet the vein-matter is barely touched; all of the ore taken by them being worked—no dumps or wash-piles visible, but slag-piles over the country everywhere.

This section has been neglected for better known fields south, west, and north of it; but I have never examined mining property which promised so much for so little expenditure. There is coal of the choicest coking variety; fire-clay, first quality; sandstone; marl, which can not be excelled for "test bottoms" in refining; and pure or nearly pure siliceous, within a few miles of the mines.

Nature has done every thing for the section as to climate; water, from never-failing springs in the transition rocks; and proximity to markets.

Some day, there will be large operations conducted here without doubt. Coke is now furnished me for \$4 per ton, of quality little less than Connellsville; fire-brick, \$15 per thousand.

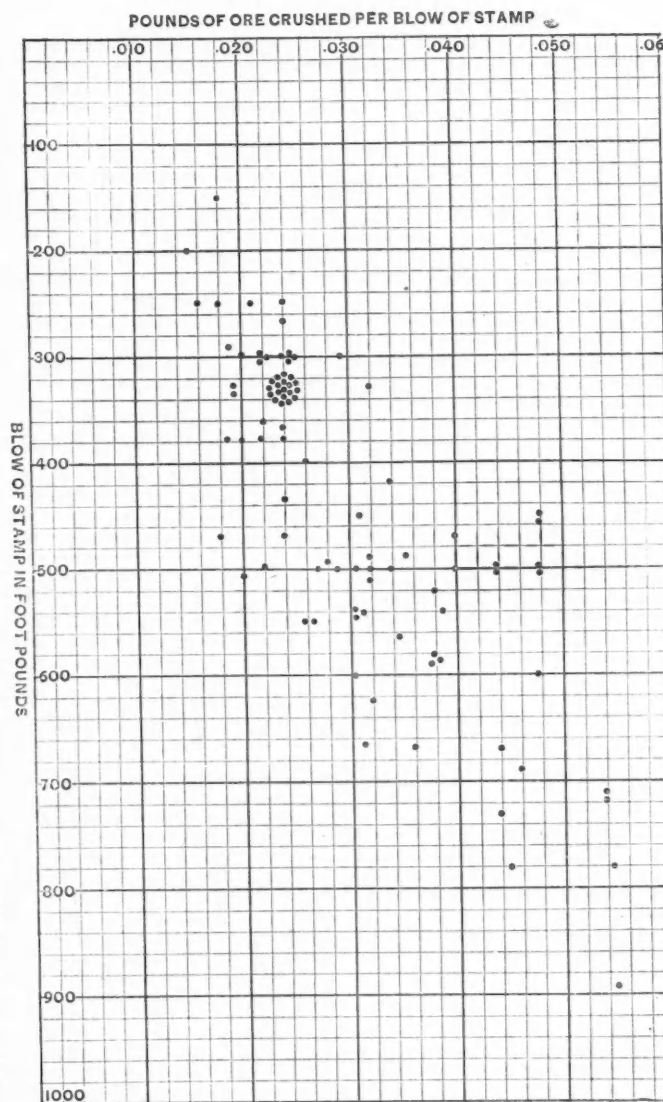
EXPLOSION IN A POWDER-MILL.—SAN FRANCISCO, March 4.—The Eureka Blasting-Powder Works, at Highland, across the bay, three miles from Oakland, exploded this morning with terrific force, shaking the buildings in this city. The explosion resulted in the death of two Chinamen, and the wounding of five Chinamen and two white men. The roof of the magazine was blown off, and the drying and packing house was destroyed. The damage to the property is slight.

BREAKING OUT FROM A MOUNTAIN.—POTTSVILLE, PA., March 10.—Several years ago, the Anchor colliery, near Heckscherville, in this county, operated by the Philadelphia & Reading Coal and Iron Company, was on fire inside, and, to overcome the fire, the water from a creek near by was turned into it, filling all the workings. The water has remained there until to-night, when it broke through the side of the mountain, carrying with it the prop-timbers of the mines and greatly damaging the road-bed of the Mine Hill Branch of the Reading Railroad at that point.

DIAGRAM I.

SHOWING THE CRUSHING EFFECT, PER SINGLE BLOW, OF STAMPS OF DIFFERENT WEIGHT AND FALL.

(Data from Raymond's Mineral Resources, 1870.)



\* A paper read at the Lake Superior Meeting of the American Institute of Mining Engineers, August, 1880. From the Transactions of the Institute.  
† Mineral Resources West of the Rocky Mountains, 1871, p. 380. ‡ Ibid. 1873, p. 345.

## ALMA DISTRICT, PARK COUNTY, COLO.

## EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Alma, situated at the junction of Buckskin Creek and the North Fork of the South Platte River, has remarkably increased within the last twelve months. Mineral is brought here by wagons and on jacks from the surrounding mountains for a distance of as much as ten miles. The Argo (near Denver) and Golden reduction companies have established their agencies here to buy ore, and even by paying freight to these points, realize satisfactory results. The business of the municipal government is in the hands of respectable and enterprising men, and the town bids fair to rank among the most important of the State. Buckskin, Mosquito, Pennsylvania, and Sacramento creeks empty into the North Fork of the South Platte River, affording all the water desired for placering, which in most of these creeks is profitably carried on. One of these placer claims just opposite Alma has yielded this last season a net profit of about \$40,000.

## SILVER HEELS MOUNTAIN.

This mountain is situated north of Alma. Its substructure belongs to the Silurian formation, which is overlain by Devonian limestone and porphyry. In its geological character it very closely resembles the formation of Leadville. Where the porphyry and limestone occur in contact, deposits of ores are found in greater or less quantity, composed chiefly of oxides and carbonates of iron, mixed with sulphuret of lead (galena) and carbonate of lead, carrying from 90 to 200 ounces of silver to the ton. At several points, large deposits of red hematite and specular iron ore have been developed, and no doubt these ores will prove of great value (when furnaces are established at this point) as fluxing material to reduce the silver-bearing lead ores. On the eastern slope of the mountain, near Hamilton, and in the Park to the west and south of Como, near the Breckinridge Pass at the head of Tarryall Creek, hematite iron of a very fine quality and in great quantity has just been exposed; and as coal of excellent quality is now mined near by, these iron-ore deposits must soon become of great value. A number of prominent capitalists have just organized a company for the purpose of mining these iron ores and developing the coal-fields, and will also later erect furnaces for the reduction of these ores.

## MOUNT BROSS.

This lies between Platte River and Buckskin Creek, and just south of and adjoining Mount Lincoln. Here are some of the oldest mines in Colorado, such as the Dolly Varden and the Moose, which were worked ten years ago for gold, but it is only within the last six years that the ores, as silver producing, have been discovered of any value. Since this discovery, several hundred claims have been developed, many of which have proved valuable and give employment to several hundred men. The formation is similar to that of Silver Heels Mountain, the rock being chiefly porphyry, containing both vertical and flat veins of mineral. The ores occur in various deposits, sometimes in vertical veins, with quartz as a gangue, carrying argentiferous galena, carbonate and oxide of iron, with some carbonate of copper; frequently honey-combed quartz occurs, which invariably carries more or less native gold. Another mode of occurrence is flat veins. Where the porphyry and limestone come in contact, the ores lie between the two layers of rock. These flat veins dip into the mountain at nearly every angle, and in some cases are almost vertical—in fact, so frequently does the angle approach the vertical, that many here call these deposits fissure-veins. Another mode of occurrence is in the decomposed porphyry, which is to be found in the Dolly Varden and in the well-known Russia mine. The latter has been developed by running in a tunnel several hundred feet, and by side-tunnels varying from 10 to 50 feet in length. At some points, large excavations have been made, forming immense rooms, most of these spaces now being filled in with refuse rock. The ore is galena, carbonate of lead, siliceous iron, and a sandy carbonate, but the richest ore is the chloride of silver in the honey-combed quartz, which is found in large masses in the decomposed porphyry. A very rich ore is also found immediately between the overlying decomposed porphyry and the underlying limestone. The thickness of the ore-bearing beds varies greatly. At some points, the decomposed ore-bearing porphyry is only a few inches thick, then widens out into many feet. The ore occurring between the limestone and porphyry partakes of the same character, sometimes pinching down to the thickness of a knife-blade, then widening to several feet, but in no instance entirely disappearing. No doubt these flat veins were originally horizontal; that is, the limestone certainly was flat, either horizontal or inclined at a slight angle. After being covered by porphyry through great internal dynamic forces, these rock-deposits (for both the limestone and porphyry are deposits, the former from water, the latter through volcanic action) have been disturbed, as is now plainly visible. Sometimes the limestone is horizontal for many feet, then suddenly dips at an angle of 45° for a distance of 20 or 30 feet; then the angle becomes gradually less, until it returns to the horizontal once more. At times, however, the change is more sudden, as at some points it immediately returns to its horizontal position.

On the northern slope of Mount Lincoln, near the head of the Platte River, and distant about one half-mile from the Russia mine, there frequently occur vertical veins in the porphyry, the gangue of which is a hard, dense quartz, which sometimes carries as high as 200 ounces of gold to the ton. A short distance below these gold-bearing quartz veins, are situated the famous old Montgomery placers, which gave employment to several thousand men during the great gold excitement from 1859 to 1862. Among the most promising of the new discoveries on the two mountains are the Present Help, Wheeler, Sweet Home, Colorado Springs, Little Berlin, Security, No End, Criterion, Ten-Forty, Jersey, Golconda, King William, Adrian, Belle of Buckskin, Centennial, and others.

## LOVELAND HILL.

This mountain was formerly called Buckskin Joe; but since Mr. W. A. H. Loveland made it famous by the purchase and development of the Fanny Barrett mines, it has been called Loveland Hill. The formation is similar to—in fact, almost identical with—that of the mountains already described. On this mountain, some of the most valuable mines of this district are now worked and are daily producing pay-ore, notably the

mines known as the Fanny Barrett combination, including six or eight pay mines, lately owned by Mr. W. A. H. Loveland, but now sold to the North American Mining and Developing Company of New York. The affairs of this company are under the control of Mr. Milton Saylor, late representative in Congress from Cincinnati. There are a number of other paying mines on this mountain, namely, Ernest, Sir Charles, Tanner Boy, Faro, Avalanche, La Salle, Silver Exchange, Cock Robin, Carbonate, Lunt, Congress, Orphan Boy, Senate, Kansas, Grace, Red Lion, Mahany, Phillips, American Flag, Fairfield, Mirza Shaffy, etc., etc.

## MOSQUITO GULCH.

This gulch is bounded on the north by the southern slope of Loveland Hill, along whose side are many good paying mines, several of which have already been mentioned.

## PENNSYLVANIA MOUNTAIN.

This lies south and southeast. A great deal of prospecting was done last summer, and sufficient developments made to prove the presence of large deposits of ore. Several of the mines have begun shipping ore. The most important ones are the Juniata, Dancer, Silver Giant, Great Napoleon, Grant, Imperial, Ohio, Charter Oak, Silver Peg, and George Washington.

## LONDON MOUNTAIN.

South and west of Mosquito Gulch and separated from Pennsylvania Mountain by South Mosquito Gulch, is this mountain, formerly known as Sugar Loaf Mountain, but since the London Consolidated Mining Company commenced active work on a number of mines acquired by that company called London. Besides these mines, there are prominent the New York, Baltic, Gray Eagle, Sunny South, etc., all shipping more or less.

## PENNSYLVANIA GULCH.

Here are a score of claims, which show porphyry overlying iron beds. From the developments already made, they show a great similarity to the Leadville deposits, especially to the Iron mine belonging to Stevens & Leiter; and it is the opinion of Mr. Stevens that the Leadville carbonate belt crosses the range and extends into South Park; and these outcrops and beds of iron exposed in Pennsylvania Gulch would seem to substantiate his theory.

## SACRAMENTO MOUNTAIN.

This is a spur of Mosquito range, southeast of Pennsylvania Mountain and northeast of Mount Sheridan. Although not as much prospecting was done here last summer as on those already mentioned, yet sufficient was done to show that it contains similar deposits to those described. A number of claims yielded pay-ore from the outcrops, and continued to increase in richness as greater depth was reached. Among the paying mines which have already shipped considerable quantities are the mines of the Sacramento Mining Company (the principal of which is the Sacramento mine).

Arrangements have been completed for the erection of amalgamation and lixiviation works, to be under the direction and management of Prof. Paul Langhammer, who has exhibited his plans and specifications, which are now to be seen in Denver.

AD. KLINKENSPOR.

## PIMA COUNTY (ARIZONA) MINES.

## EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Southeastern Arizona ranks among the best mineralized regions of the West. Eastern and Western capitalists and mine operators vie with each other here, while manufacturers and merchants of both coasts are striving to obtain control of the important trade. This competition is beneficial, and on joining the two great commercial arteries that are now only fourteen miles apart, there will be a scene of greater commercial strife. However, there is no insane boom here, attended with undue excitement and disappointment, but a steady influx of people. It is true that most of the population is muscle and not money. What has pleased the Californian and Comstocker, who have visited us lately and invested in the mines, is the fact that pay-ore is found so near the surface. None of the mines has reached over 100 feet in depth; yet this depth is in ore. To convey the impression that all the mines are of this kind would be to mislead; but many, especially those that have mills, show permanency. It is true that failures from various causes occur, chiefly mismanagement and bad judgment. The several mining districts of this county are named in the order of their productiveness and importance, although these positions may be changed before the expiration of the year.

Tombstone, 26 miles from the railroad, with a population of 3000, two daily papers, two banks, and innumerable stores and saloons, is the business center of the district of the same name, and is situated on a rough and rolling mesa, backed by a low range of mountains, in which the principal mines are chiefly found—Tough Nut, Contention, Grand Central, and Head Center, existing in a porphyritic formation, capped by granular limestone. The first mine shows great deposits of ore; the others are large and permanent fissure-veins, the ores being carbonates and chlorides, and averaging not far from \$100 per ton. Other mines have veins which, by proper development, may turn out to be fine properties. Water and timbering, so far, have given little trouble. The ore is treated by the milling process on the San Pedro River, from 7 to 12 miles distant. There are schemes to bring water to the mines, saving from \$4 to \$6 per ton for hauling. Last year's production was nearly 2½ million dollars; this year will double that with increased milling capacity.

Harshaw District, Patagonia Mountains, 50 miles south of the railroad, has several valuable mines, with the usual complement of undeveloped locations. The formation is feldspathic, with granular limestone to the south. The mountains are higher than the Tombstone, and covered with inferior live-oak, while the canons have subterranean water-courses. The Hermosa and Hardshell groups are very similar, the ores being chloride of silver in feldspathic gangue, friable and free, therefore easily milled. Twenty stamps crush from 90 to 100 tons daily, leaving little value in the tailings. The ores are mined and milled cheaply—probably not over \$10 or \$11 per ton. On the former, a depth of 400 feet has been reached, said to be more and better grade than the upper levels. The Alta and Trench appear to be well-defined fissure-veins, from 3 to 5 feet in width, with good walls. The ores are refractory, carrying anti-

mony, necessitating a preliminary process, but they are of high grade. Only the Hermosa has a mill, although the other mines named contemplate plants this year, when the bullion yield must be large.

Bisbee is situated in the Mule Mountains, and very nearly triangular with the above districts, being about 35 miles from each. Although a camp of 1880, it has obtained prominence from the fact of being a producer. The ore, a copper carbonate, mostly malachite, occurs in large bodies in the limestone. The method of mining is quarrying, whereby large masses are blasted down at a single explosion. The cost of mining, consequently, is very cheap. The furnace-runs yield an average of about 25 per cent copper matte. The ore contains its own fluxes, and is reduced in a cupola by the aid of coke from San Francisco, owing, as I am informed, to the lack of water for large works. It is in contemplation to build several smelters on the San Pedro River. The amount of ore treated will more than pay for the hauling. The Copper Queen and the Copper King are best known. To the former belongs the smelter, which ships its matte East for refining. It produced last year between \$300,000 and \$400,000 from a half-year's run on a small furnace. It is predicted that this territory will produce 20 per cent of the copper needed in this country.

The California District, in the fine grazing San Simon Valley, is near the railroad. Although young, it shows a great deal of life, due to the development of several mines which are in the limestone, the ore being a good grade of lead carbonate, which is easily treated. Water appears to be plenty by sinking. Coke, no doubt, will, on the connection of the railroad, be brought from New Mexico and Colorado. The Texas mine is down over 100 feet, and the ledge in the bottom shows well; it will possibly average 5 feet in width. The smelter for the mine has been purchased and is on the way, and will no doubt be in operation in a few weeks. The Hill-Christmas and Grand Pacific mines show that they will pay to develop.

Washington Camp District joins the Harshaw on the south, and north of Sonora, Mexico. It is in the syenitic granite, heavily blanketed by altered limestone. This district has not long been opened; yet some years ago, a few adventurous pioneers operated there. But the murderous attacks of the Apaches, the treachery of the Mexicans, and the long distance from supplies caused an abandonment of the mines. Lately, a new life has been infused into the camp. Now the large bodies of medium-grade carbonate sulphuret ores will receive the attention they merit. The Davis mine is building a smelter on the Santa Cruz River, to treat the carbonate of lead ores coming from the well-developed mine. The Holland, after several trial-runs, is preparing for a campaign. The "Pool mines," lately passed under the control of General Anderson and others of Richmond, contemplate putting a large force to work to properly develop the various claims. A 60-ton plant will be erected soon to work the ores. The owner of the Silver Bill has by sinking and drifting opened the mine with good results. Other mines are also receiving attention.

The Consolidated Arizona, of Arivaca District, has started its mill. The Santa Ritas has several prominent properties. The Empire, Old Hat, and other districts have some good mines.

Recapitulating: Tombstone, Harshaw, Bisbee, California, Washington Camp, Arivaca, Santa Ritas, Empire, Old Hat, etc., have in a few years made rapid progress. The genial climate, a winter more like spring, summer no more oppressive than in the East, a fine grazing country, more wood and water than Arizona is credited with, are advantages that will make this section a large bullion and stock producer.

PIMA Co., ARIZONA.

J. M. G.

THE PRODUCTION OF BESSEMER STEEL IN THE UNITED STATES IN 1880.

We have received complete reports from the eleven Bessemer steel-works of the United States, detailing their production in the calendar year 1880. The production was larger than the estimate we formed of it at the close of the year.

The total quantity of Bessemer steel ingots produced in the United States in 1880 was 1,203,173 net tons, or 1,074,262 gross tons, against 923,972 net tons in 1879, 732,226 net tons in 1878, and 560,587 net tons in 1877. The increase over 1879 was 274,201 net tons, or 30 per cent; over 1878 it was 470,947 net tons, or 64 per cent; over 1877 it was 642,586 net tons, or 115 per cent. The production of Bessemer steel ingots in this country from 1872 to 1880 was as follows, in net tons:

1872.....	120,108	1877.....	560,587
1873.....	170,652	1878.....	732,226
1874.....	191,933	1879.....	923,972
1875.....	375,517	1880.....	1,203,173
1876.....	525,996		

The total quantity of Bessemer steel rails produced by these eleven works in 1880 was 917,592 net tons, or 819,279 gross tons, against 683,964 net tons produced by the whole country in 1879, 550,398 net tons in 1878, and 432,169 net tons in 1877. The total Bessemer steel rail production of the country from 1872 to 1880, not including rails rolled by iron mills in 1880 from purchased blooms, was as follows, in net tons:

1872.....	94,070	1877.....	432,169
1873.....	129,015	1878.....	550,398
1874.....	144,944	1879.....	683,964
1875.....	290,863	1880.....	917,592
1876.....	412,461		

Several iron rolling-mills rolled Bessemer steel rails in 1880 from purchased blooms, and reports of their operations have not yet been collected from those establishments, but perhaps 50,000 net tons of such rails may have been rolled by them last year.

Although the Bessemer steel production of 1880 was very large, it will be greatly exceeded in 1881. The Vulcan Steel-Works, at St. Louis, did not get into operation until March 10th, 1880; this year they will make full time. All the other old works are improving on their productions of last year, and some of them will have an enlarged plant at work, notably the Bethlehem Iron Company and the Pennsylvania Steel Company. Several new Bessemer steel establishments will get to work in 1881, the Pittsburg Bessemer Steel Company, Limited, being now about ready to begin production, with a capacity of 60,000 gross tons of ingots a year, while the North Chicago Steel Company and the Colorado Coal and Iron Company are pushing their works to completion as rapidly as possible, with a prospect of turning out Bessemer steel before the snow of another winter shall have made its appearance.—*Bulletin of the American Iron and Steel Association.*

A NEW DEPARTURE IN THE SILVER MILL.

Written for the Engineering and Mining Journal by W. L. Austin, Ph.D.

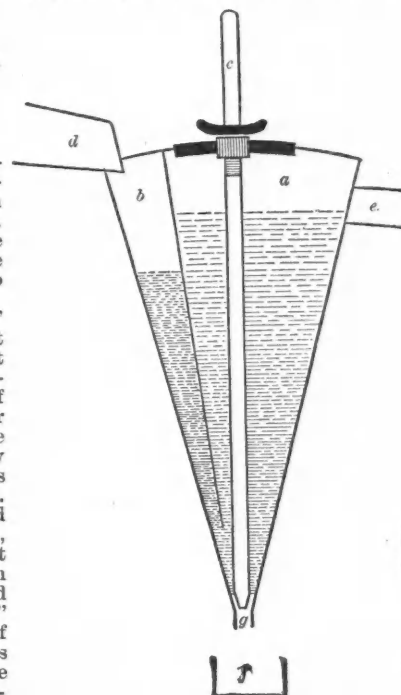
Within the last few years, many improvements have been added to this essentially American invention, the silver mill, and Americans have just cause to be proud of the achievements in this branch of metallurgy made on the Pacific slope. Lately still another advance has been accomplished which renders the process well-nigh a perfect one. Mr. M. P. Boss, already well known among mill men through his invention, the quicksilver pump, has recently perfected a combination of separating hopper and pans that does away with the tedious and expensive tank shoveling, and permits of the pans being charged without any handling of the pulp. The stamping, grinding, and amalgamation are made one continuous process. A short description of this system, as in operation at the mills of the Harshaw Mining Company, Arizona, will best serve to illustrate its working.

For treatment of pulp crushed in a ten-stamp mill, a series of eight pans, four settlers, and one agitator is employed. Two of these "series" are in operation. The pulp, after leaving the batteries, is conducted into a

SEPARATING HOPPER,

in which the coarse sand requiring grinding is separated from the slimes.

- a. Sheet-iron funnel.
- b. Partition.
- c. Rod for regulating valve g.
- d. Trough leading from battery.
- e. Discharge for slimes.
- f. Discharge for sand.
- g. Valve.



This contrivance is very simple, and needs no further description than that given in the accompanying sketch. The sand, after settling in the funnel, passes through the opening at f, and runs into the first pan of the series.

The pans are of the "Eclipse" model, modified; are five feet in diameter, and make about seventy revolutions per minute. The entire eight pans of the series are connected near the top by pipes, allowing the pulp to flow uninterruptedly from one to another as fast as it is fed in from the batteries. In pans Nos. 1 and 2, the sand alone is treated. It is ground, but does not come into contact with quicksilver. Flowing on into pan No. 3, it meets and mingles with the "slimes" coming from the overflow e of the separating hopper. In this and subsequent two pans the pulp is ground and amalgamated both, the requisite chemicals for the process being fed into pan No. 3. When pan No. 4 is reached, the grinding ceases, and in this and remaining two pans of the series amalgamation simply takes place. In No. 7, chemicals again are charged, designed to act upon the conditions of the mercury disseminated throughout the pulp. The pans are kept at about 175° F. From pan No. 8, the pulp flows into a series of four settlers, all connected by pipes, as in the case of the preceding pans, and finally falls into an agitator, and thence into the tailing sluices, so deprived of the precious metals as to leave no hope of its ever being worked over again. The chemicals are fed into the pans by means of an ingenious automatic arrangement that insures regularity and exactness.

The mercury is charged into each pan separately, and drawn off at intervals of one hour through inverted siphons.

This constant renewal of the quicksilver brings the pulp into contact with fresh, clean mercury several times before it escapes into the sluices.

The advantages claimed by Mr. Boss for his system of continuous working are the following:

1. More ore can be put through in a given time.
2. The pulp is worked more closely.
3. Less loss of quicksilver.
4. Wear and tear on machinery lessened.
5. Labor expenses largely decreased.
6. Constant and even manipulation of the pulp.
7. All loss in slimes avoided.

The saving in the wages of tank-men alone is quite an item; besides, the duties of the amalgamator are considerably lessened, thereby enabling one man to watch over numerous pans.

At the Harshaw mills, this system has given great satisfaction. Ninety tons of ore a day are treated by it in sixteen pans, which work up to nearly 90 per cent.

**Timber Seasoning and Preserving.**—A foreign exchange describes a method which it says has been utilized to a large extent in France. By this new process, the antiseptic properties of carbolic and other tar acids are carried through the heart and the innermost pores of the largest log, all the free water and fermentable sap being extracted by superheated steam. It is said that all kinds of wood may be preserved. A noteworthy thing reported is, that the timber is first so softened by the process, under appropriate treatment, it may be pressed into various shapes, after which it hardens, and resists the attacks of fungi or of insects. As licenses have been taken out in England, we may hope for fuller information as to the process itself and its practical results.

CHEMICAL AND METALLURGICAL CONSIDERATIONS ON LEAD SMELTING.

Written for the Engineering and Mining Journal by Malvern W. Iles, Ph.D.

A slag has recently been produced at the works of the Grant Smelting Company, which the writer thinks presents sufficient characteristics to claim the attention of both chemists and metallurgists.

The first point noticed in connection with this slag was that, while its density was found to be quite low (average of three determinations gave 3.556), yet no sign of a glassy edge or "bottle slag" was perceptible. It has been frequently observed that slags having a density of 3.68 showed a very marked glassy structure, and slags having even a higher specific gravity show a trace of glassiness on the outer edges when molded. Ores containing from 5 to 7 per cent metallic manganese have been noticed to produce a very clean slag, and at the same time allow the production of a fairly liquid slag, containing from 35 per cent to 39 per cent silicic acid, whose density will not be greater than the slag above given.

The product under consideration showed by fire-assay only 1.50 ounces silver per ton and 1 per cent lead, while a lead bullion of 280 ounces silver per ton was produced.

I take this example not because it constitutes a marked exception in the small percentages of loss in lead and silver, but chiefly as a marked exception of a low density—its fluidity, and for other physical as well as chemical characteristics.

The chemical analysis gave the following results :

	Per cent.		Per cent.
SiO <sub>2</sub> .....	39.100	CaO.....	8.300
FeO.....	30.085	MgO.....	3.800
MnO.....	5.023	PbO.....	2.649
Al <sub>2</sub> O <sub>3</sub> (diff.).....	.849	S.....	1.104
			100.000

The slag was decomposed by potassium hydroxide, according to the method previously given (ENGINEERING AND MINING JOURNAL, January 22d, 1881). The potash contained some alumina, hence this ingredient of the slag was taken by difference.

The ratio of the oxygen of the SiO<sub>2</sub> to the oxygen of the bases is as 20.8 : 13.7. Hence we have a mixed silicate or a union of the *singulo* and *bi* silicates.

At most of the smelting-works about Leadville, a larger percentage of CaO is found in the slags than that shown above, noticeably at the Billing & Eilers Smelting-Works.

The above slag may be described as a black, highly lustrous, fine-grained, and crystalline product, some portions of which were steel gray.

In order that the analytical data may have their proper significance to metallurgists, the conditions, as nearly as possible, will be given in the production of this slag.

Charge :

500 lbs. ore mixture (which see).
50 " limestone (55 per cent, 57 per cent CaCO <sub>3</sub> ).
100 " old slag.
70 " Elmoro coke.
70 " pine charcoal.
790

The ore mixture contained 102 lbs. lead per charge of 500 lbs.=20.4 per cent.

The beds are generally so calculated that the percentage of metallic iron is equivalent to the percentage of silica.

It may be stated that a moderately fair rule is to have six pounds lead to the ounce of silver, in the calculation of the ore-beds, in order to produce a slag not containing too much silver.

The slag is frequently more siliceous than the calculation upon the ore-beds shows; this is due not unfrequently to the siliceous ash of the coke. Recent tests show the cokes here used to vary from 15 per cent (Denver & South Park) to 22 per cent (Elmoro, Fe=11 per cent, SiO<sub>2</sub> 69.4 per cent).

ORE-BED.

NAME OF MINE.	Lbs. Gross.	SiO <sub>2</sub> Per cent.	Fe Per cent.	Pb Per cent.	Oz. Ag.
Silver Wave.....	31,040	17.7	49.3	7.15	550.2
Evening Star.....	20,000	14.2	6.8	23.92	441.6
Little Chief.....	21,360	14.3	13.0	33.30	1,248.0
Silver Wave.....	20,000	12.8	32.9	5.95	365.2
Little Chief.....	20,000	33.6	14.4	18.80	990.0
Henriette.....	40,000	8.6	45.2	38.80	912.0
Hibernia.....	15,130	22.1	25.7	none	442.5
Morning Star.....	20,000	14.2	11.0	42.30	186.0
Catalpa.....	20,000	18.5	5.4	45.00	646.0
Highland Chief.....	7,810	15.1	2.5	15.40	562.4
Little Chief.....	20,000	28.3	19.9	9.35	357.2
	235,340	225.4	226.10	240.85	6,710.1

Where smelting can be carried on by the formation of large ore-beds, this is always advisable, however careful the metallurgist, the chemist, or the workmen may be. There is not only less liability to mistakes, as one does not then have to depend so much on the accuracy of foremen, wheelers, etc., but there is also a very good chemical reason for smelting upon large mixtures.

Mr. M. C. Smith, metallurgist and general superintendent of the well-conducted La Plata Works, has constantly on hand a number of ore-beds of from 400 to 600 tons each.

Inasmuch as the Leadville ores are not roasted, even when almost pure galena lots are treated, it necessarily follows that the most serious obstacle the smelters have to contend with is the troublesome galena hangings, which so accumulate as to prevent the free working of the charges. These hangings are composed not only of native galena, but also the artificial galena, and the subsulphide of lead produced from the partial reduction of the sulphate, which exists in the Evening and Morning Star, the Catalpa, and a number of the ores in considerable quantities.

Barring off these crusts from the top is not only productive of expensive delays, but also is accompanied by considerable loss of lead; as the furnaces have to be partially run down. These crusts contain not only various arsenic and antimony compounds, but it is highly probable that,

to the readily fusible mineral Lanarkite (sulphato-carbonate of lead), they owe their chief tenacity to the sides of the furnaces.

I have frequently thought that quicklime thrown only upon the sides of the furnaces might be advantageous in the removal of the sulphur from the galena, by the formation of a calcium oxy-sulphide.

In exactly what form the sulphur enters the slag, however, is not a settled point. The experiments of Marazec would seem to indicate that the loss in silver in the slags had a direct bearing upon the amount of sulphides; his experiments failed to show whether the sulphur was in combination with the calcium or not. It is highly probable, however, that it is not combined with the lead, as I have seen stated in several analyses of slags.

The use of quicklime would be quite inexpensive; say 10 bushels per day, at 30 cents per bushel, used on each furnace, would be no serious expense.

Furthermore, it might be advantageous to feed the limestone only on the sides or rim of the furnace, which would be converted into quicklime. This change would, however, take place too low down in the furnaces to be very efficacious.

The use of lime brings us to the consideration of slags produced at the works of Messrs. Billing & Eilers. These works the writer thinks among the most systematically conducted in Leadville, and the general superintendent, Mr. A. Eilers, a master smelter, has been too long and well known throughout the West, for any introduction to students of metallurgy.

The results obtained from samples of slags from the above-named works were as follows :

Density (3.537, 3.637, 3.530) = 3.580 average.  
Per cent lead by fire-assay (1/2 per cent, 2 1/2 per cent, 3/4 per cent) = 1.25 per cent average.

Silver, 1 ounce per ton (average of three samples).

ANALYSES.

	Per cent.		Per cent.
SiO <sub>2</sub> .....	30.203	CaO.....	22.800
FeO.....	36.186	MgO.....	0.144
MnO.....	3.813	PbO.....	2.355
Al <sub>2</sub> O <sub>3</sub> .....	4.293	S.....	0.618
			100.259

The percentage CaO is larger in this slag than any I have ever seen in lead smelting. A very pure limestone was used in the production of this slag; indeed, a crystalline limestone. The MgO, it will be seen, amounts to only a trace.

The ratio of the oxygen of the SiO<sub>2</sub> to the oxygen of the bases as (16.02) : (18.14) :: 1 : (1.13), or a true *singulo*-silicate.

The general appearance of the above slag is very characteristic; in color it closely resembles the minerals of the Epidote group, being brownish to a dark yellowish green; some portions are distinctly resinous. It crystallizes in long four-sided monoclinic prisms. One sample noticed had beautiful terminations of the prisms, as in the case of Allanite. (See Dana's *Mineralogy*, Figure 269.)

Professor Dana says, "Epidote has not been found amongst the crystallizations of furnace slags, or formed in the laboratory of the chemist." The crystalline form so closely resembles the epidote minerals that we think it highly probable this product is an artificial epidote.

Furthermore, the density, color, and chemical analysis lend force to this supposition. A very distinguishing feature of this slag is the fact that when the acicular crystals are held between the eye of the observer and a strong light, the crystals are seen to be semi-translucent.

CHLORO-BROMIDE OF LEAD.

A compound, having the formula PbBrCl, has recently been discovered by the writer as a furnace product. It was found in the small 2 1/2-inch openings in the cast-iron supporting plates, 11 1/2 inches above the water-jacket.

The analysis of this compound gave the following results :

	Per cent.
Pb.....	63.927
Br.....	25.321
Cl.....	10.345
	99.395

A corresponding silver salt was described a number of years ago by Prof. Th. Richter (see *Berg- und Hüttenmännische Zeitung*, xviii., 449). Professor Richter obtained 64.19 per cent Ag, while, by decomposing the lead salt with nitrate of silver, a compound was obtained by us, yielding 63.76 per cent silver.

Full details of this product will be published in the State Geological Report, under the supervision of Professor Emmons.

CHEMICAL LABORATORY GRANT SMELTING CO.,  
LEADVILLE, COLO.

HEAVY DAMAGE AT ROSITA, COLO.—ROSITA, COLO., March 10.—A fire broke out this morning in Miller's grocery store, and spreading thence, destroyed the entire business portion of the city, including the post-office with its contents, together with several stocks of merchandise. The fire was evidently of incendiary origin, an outhouse, the ice-house, and the floor of the grocery having been saturated with coal-oil. The outhouse was first discovered to be on fire, and immediately afterward the flames broke out in the interior of the store, and an explosion soon occurred, scattering firebrands in every direction. The water supply from the wells was soon exhausted, and the flames were allowed to take their course. The loss is estimated at \$130,000, distributed as follows: F. C. Miller & Co., \$20,000; H. H. Tompkins, \$18,000; C. C. Smith, \$4000; Grand View Hotel and furniture, \$7000; Mrs. Tucker, \$1500; Frederick B. Erlhaff, \$20,000; Joseph Wilson, \$10,000; William McLaughlin & Co., \$4000; B. D. Payne, \$10,000; Merchants and Merchandise Bank, \$15,000; Samuel Huber, \$5000; W. S. Knight \$4000; D. M. Parker, \$6000; Mrs. Hollowell, \$1000; W. B. Smith, \$3500; Slavick & Brother, \$2500; Geoch & Barrett, \$1000; William Diehl, \$2000; and other smaller losses. The insurance will cover only a small portion of the loss. Among those insured are Miller & Co. for \$8500; Tompkins & Co., \$5500; Parker, \$1700; C. F. Blossom, \$6500; Grand View Hotel, \$4200; McLaughlin, \$1500. The records of deeds and all records pertaining to the county court were saved.

**ASPHYXIATION BY CARBONIC ACID, AND INTOXICATION BY CARBONIC OXIDE,**

By Mr. Meurgey. Translated for the Engineering and Mining Journal by T. Egleston, Ph.D.

**EDITOR ENGINEERING AND MINING JOURNAL:**

SIR: Having recently been a victim of poisoning by carbonic oxide, which poisoning was ascribed to malaria, and occurred after breathing air containing a very small quantity of carbonic oxide, and having suffered for a considerable time from this poisoning, I beg to call the attention of your JOURNAL to the subject. I have translated an article which I send to you, on a severe case of poisoning by this gas in France, and beg that you will ask the readers of your JOURNAL to send me accounts of any well-authenticated cases of such poisoning, with their symptoms, and the remedies used for them, in order that I may collate and publish them, and also in the hope that, if the symptoms described are widely published, they may be recognized, and save health and possibly life.

NEW YORK, Feb. 28, 1881.

Yours truly,

THOMAS EGLESTON.

The physiological phenomena which accompany asphyxiation by carbonic acid and intoxication by carbonic oxide, either in coal mines, from fire or by the explosion of fire-damp; or in metallurgical works, in blast-furnaces, or in gas furnaces, etc., are only known from what can be told of them by their victims, who are generally workmen not capable of carefully observing what takes place, and of giving an exact account of it.

On September 7th, 1880, I was a victim of such an asphyxiation and intoxication, and was able to observe the phenomena which preceded and followed these very carefully, and I think that their description will not be without interest.

Mr. X. works, at Bérard St. Etienne, a foundry which includes among other things a furnace for drying his molds. This furnace is placed next to a wall which separates the property of Mr. Y., the coke fire-places being against the wall. The gas which comes from the combustion and the steam given off from the molds after passing through the furnace go out by a chimney which has a very poor draught.

On the other side of the wall, on the property of Mr. Y., there is a small court, the floor of which is on a level with the vault of a house on the street, and a small building attached to this house. This small building contains on the level of the court a cellar, and on the level with the first floor of the house a storage-room. In front of the latter and in the house is a large room which is used for a kitchen. This kitchen, the storage-room, and the cellar make up the dwelling of Mr. and Mrs. Z. The fireplace of the furnace is exactly opposite the cellar.

For one operation of the furnace, from 90 to 110 kilograms of coke are charged on the grate at six o'clock in the evening. On the evening of January 29th, 1880, six persons were in the kitchen of Mr. and Mrs. Z., eating and drinking. About half-past eight, two of them were taken sick with the following symptoms: bad headache, interrupted breathing, trembling of the limbs, impossibility of speaking, convulsions resembling epilepsy, and finally fainting. While waiting for a physician, the other persons present took care of them. About four o'clock in the morning, two of these fainted in their turn.

About this time the expected aid arrived: but one of the first persons taken sick died almost immediately, and the other, carried into a neighboring house, lived only a few hours. The two others who were attacked were only brought to life and health with the greatest care, after a long and severe illness.

The furnace of the foundry had been lighted on the 29th, in the evening; but in the judicial inquiry which followed, no one thought of anything but of what had been eaten and drunk, to explain what had taken place. The analyses of the food and wine and the investigation on the bodies of the victims did not show anything. The 6th of February, toward six or seven o'clock in the morning, Mr. and Mrs. Z. were taken sick in the same way. Two lodgers on the floor above were also taken ill, but not so badly. The physician who was called announced that they were all suffering from a carbonic intoxication, and suggested that the gas came from the burning of the bed of coal known as third Bérard, as occurred in 1866; but near midday it was discovered that through a number of fissures in the partition-wall gas was escaping into the court and the cellar, and that these poisonous gases came from the furnace, and attention was then directed toward it. On the night of the 11th and 12th of March, the furnace was working, and Mr. and Mrs. Z. came very near being asphyxiated in their own apartment.

Immediately after this third accident, Mr. Y. summoned Mr. X. before the civil tribunal, which ordered an examination, in which I was engaged. We then found at several different times an escape of carbonic gases more or less pure from the furnace into the court, the cellar, and the storage-room, from the fissures in the partition-wall.

March 24th, in the morning, after having remained in the court and in the cellar for nearly two hours, but with a number of interruptions, and frequent goings and comings for the experiments on the gas escaping from the fissures in the wall, the three experts were all seized with violent headaches, although the escape of the gas was feeble and not continuous, and no considerable quantity of gas was found except immediately against the fissures themselves. For two of these experts, the headache was relieved before night. For the third, who had not been any more exposed than his colleagues, it lasted a much longer time, and was accompanied in the afternoon by a complete indigestion, though he had dined very lightly. On September 7th, about half-past eight in the evening, Mr. Y. came in a carriage for me, to show that the cellar and the court were inundated with gas, which put out the flame of a candle, and at nine o'clock I was in the little court in a state of perfect health. The evening was superb. A considerable escape of gas was taking place through two fissures in the partition-wall, one of which showed in the clearest way the following phenomena: The flame of a candle placed below was destroyed at intervals, and was completely put out several times. Placed above, it became very much lengthened in a bluish cone. The partial or total obliteration of the flame was produced by a falling vein of carbonic acid: the blue cone came from an ascending vein of oxide of carbon and carbides of hydrogen. In the court there was on the ground a thin layer of carbonic acid. Before my arrival, a candle had been twice extinguished on entering the cellar. This candle was held at the ordinary height. I did not see this immediate extinction; but I found at once near the wall on the level of the ground a layer of gas, 40 meters, which put out the flame of a candle, and under the floor covering the cellar another layer of gas, 15 meters, producing the lengthening of the

flame with a blue cone in a very marked manner. Afterward, as I went back and forth into the cellar, and across the door, opened and shut each time, these layers were very much diminished by their admixture with air. I remained in this cellar hardly eight minutes, and in the small court less than six. I had not been five minutes in the cellar before I was taken with a violent headache and nausea; then, having stopped down, I felt a sort of engorgement of the arteries of the neck, and at the same time a pulsation in the temples. On coming out of the court, I was hardly able to walk; it was necessary for me to be very careful to prevent falling down several times. I then noticed with great surprise that it was difficult for me to speak. I was, however, just as sensible to all that was passing around me as usual. I went into the foundry to see the furnace, which had been heated since six o'clock in the evening under the ordinary conditions, and during a short parley with Mr. X., I was obliged to lean against a crane in order not to fall. I then felt quite sick, but thought that the open air would restore me rapidly, and went as soon as possible into the street with Mr. X., who, as he denied the possibility of the cellar being full of gas, as I had explained, I proposed should go and verify the fact for himself; and notwithstanding the condition in which I was, I thought best to accompany him. I therefore returned into the small court where we remained hardly a minute, then into the cellar where we were two minutes at the most. The two layers of gas had diminished very much. Above, the blue cone hardly showed itself at the end of the candle; and below, it was not extinguished except very near the wall where it came out. Then, feeling very sick, I wished to go out quickly into the street. It was necessary for two persons to sustain me in order to go across the vaults of the house. In this crossing, which was very short, I lost and regained consciousness once; afterward, I was unable to speak, although seeing and understanding perfectly well every thing that passed around me. As we came into the street to the air, I was unable to get into the carriage, and then fainted completely and fell upon a chair which had been brought in great haste. Notwithstanding the coolness of the night and the great care I received, I did not regain consciousness in less than a quarter of an hour. Entire consciousness came back to me instantaneously. I recognized not only the persons who had assisted me, but, besides these, others who had come to my aid afterward; but it was six or eight minutes before I was able to speak, and it was necessary to make gestures to make myself understood. My whole body was then ice-cold. My forehead and hands were covered with perspiration. A reaction set in at last, but the blood flowed so violently to my head that I was fearful of a congestion. My brain suffered very much from dull and permanent pains and frequent cutting pains, and I felt great nausea. As soon as I was somewhat better, I wished to walk home; afterward walked about 100 meters on foot, being supported by two persons, and then entered a carriage. Arrived at my own home, I fainted again during five minutes on a balcony in the open air. I then had a very bad night, with partial faintness and nightmare. The headache was intense and accompanied with nausea. The next morning I was able to get up two hours after my usual time, and went three kilometers in a carriage to St. Etienne, and came back on foot. In the evening I still had headache. The following night was a comfortable one, but the headache in the brain continued during four days more, and during this time I had almost no appetite. The care that I received at the time consisted entirely in rubbing the temples, the neck, and the arms with camphorated alcohol, and in drinking small quantities of the usual cordials.

Of all my sensations, that which made the most vivid impression upon me was the impossibility of talking before and after fainting, while I still had all my faculties.

Most of the place in which I was so violently attacked could certainly keep up the combustion of a lamp. This is entirely in accordance with facts which have occurred after several explosions of fire-damp, the workmen without doubt being poisoned and not asphyxiated by carbonic gases; their lamps burning by their sides, and in positions which prove that they were suddenly stopped while they were seeking a refuge or an exit, and that they made gestures, probably not being able to speak, to communicate among themselves.

Mr. Criner asked what remedies were the best to be used in case of such asphyxiation. He thought that the use of coffee, in large doses, with a certain quantity of ammonia, was most efficacious. He was witness of an accident of the same kind on a workman under his orders in a metallurgical establishment, who had lain down and gone to sleep on the hot-air pipe of a blast-furnace. This man was quickly asphyxiated by the carbonated gases, and had breathed a large quantity, and remained a long time in his unfortunate position; at least, he judged so from a burn on the shoulder which had forced him to remain five months in the hospital. Mr. Criner, as soon as he knew of the accident, made the man drink, first, a glass of ordinary size filled with ammonia, and then an entire liter of coffee. He only came back to consciousness after three quarters of an hour, from a complete lethargy, during which he was constantly rubbed very hard on all parts of his body.

Mr. Brustlein thought that in the case cited by Mr. Criner carbonic acid had played a more active part than oxide of carbon, the presence of which in any appreciable quantity seemed to him very doubtful in the hot-air conduits; but this circumstance explained the success of the means of resuscitation employed by Mr. Criner.

Mr. Baretta added that the carbonic acid, the deleterious properties of which are altogether insignificant, or at least have not been very clearly explained, simply asphyxiates; while carbonic oxide, which has been known for a long time as a strong poison, produced a real poisoning of the lungs and of the brain, against which it seemed difficult to struggle; for certain specialists assure us that the inspiration of oxide of carbon, even in small quantities during two minutes only, suffices to produce death.

Mr. Brunet called attention to the fact that in this kind of asphyxiation the complete prostration of the person attacked is always preceded by an extreme excitement of the nervous system.

Mr. Meurgey, in support of what Mr. Brunet said; called attention to the epileptic state which preceded the intoxication in the persons attacked in the accident of January 29th, and which was thoroughly attested by several witnesses. In certain cases, rubbing with ammonia on the spine, exactly as in the case of poisoning by the cyanide of potassium, may have the same effect.

### PROGRESS IN SCIENCE AND THE ARTS.

**Conversion of Bar-Iron into Steel by the Cementation Process.**—The explanation offered in the *Chemical News* is, that the carbon is diffused in an impalpable powder into the heated iron, analogous to the penetration of a red-hot porcelain crucible by carbon in an impalpable powder, observed by Mr. R. S. Marsden (Proceedings of the Royal Society of Edinburgh, vol. x., p. 712), the carbon diffusing into the bars of iron while in an expanded and softened state. Silicon may apparently diffuse in a similar way through iron.

**Photography as an Aid to the Study of Geology.**—Under this head Mr. J. Vincent Elsdon, in the *Photographic News*, urges strongly the advantages offered to the geologist by photography. All men of science are not skillful draftsmen; and if they were, the time required by field-work would not permit them to accurately delineate more than comparatively a few of the many objects coming under view; while photography would furnish a rapid, easy, and accurate substitute for drawing, with the special advantage of representing without exaggeration or undue prominence. The writer holds that, although in the beginning phenomena should be explained by easily intelligible diagrams, photographs would be far more useful as a preliminary to practical work, because here prominence is given to nothing, "and the eye has to search the picture for the required object as diligently as the field geologist searches the face of the cliff or the side of the cutting." Photography has a further claim in its power of reducing, upon a rigorously correct scale, a large area to a space that permits the eye to contemplate the whole at once, without losing that detail which a survey from a distance involves. Contortions may be observed, whose curves would be inappreciable in a small area; the parallelism of systems of joints be detected, and their angles of intersection measured; the angle of dip determined, sometimes more accurately than by any other means; and the relation of minute details made more distinct. The natural section may show an alluvial gravel and a glacial gravel identical in structure; but the photograph would generally reveal a tendency to stratification in the former, with the longer axes in the planes of bedding, as contrasted with the indiscriminate arrangement of the latter. Where the face of the country continually changes from denudation, as in the soft Eocene cliffs of Hampshire or on the sandy slopes of Alabama, where huge ravines are rapidly formed, photography would furnish an easy means of estimating the amount of erosion in a given period. Many interesting sections are spoiled for geological purposes, as deserted quarries overgrown with vegetation, and cliffs hidden by soil loosened from above by the action of frost. The photograph would show the section in its best condition, and also record the continual changes undergone. "How great would be the interest now of a photograph of old Vesuvius, before the formation of the new crater entirely altered the configuration of the mountain!" Further advantages are stated; as, the necessity of representing fossils *in situ*, and, where fossils have been safely deposited in cabinets, the photographic record of them before the oxidizing action of the atmosphere has caused them, as in many cases has happened, to crumble slowly away. For further statement and illustration, the reader is referred to Mr. Elsdon's paper itself, and to future communications, in which he promises to describe and dispose of such difficulties as may occur.

**Diseases of Miners.**—In the *Popular Science Monthly* for March, which, by the way, we may say maintains its high standard of excellence, a summary is given of the diseases of miners, as they have been specially studied by Dr. Paul Fabre, of Commentry, France. The diseases prevalent among workmen who labor in damp or wet galleries are largely governed by certain accessory circumstances. No morbid symptom is developed among those who work in a gallery which is simply damp and of a temperature not exceeding 58°. But if cold water falls upon them, or if they have to put their legs in water, they become subject to lumbago, sciatica, to indefinite pain in their limbs, and often to rheumatism, generally subacute, sometimes chronic, most frequently localized in a single joint—generally that of the left knee, on which the pick-men and heavers rest in working. In galleries saturated with moisture and where the temperature exceeds 77° or 86°, the workmen are soon overcome with an extreme lassitude; they get hot, they gasp for breath, the sweat rolls down their bodies, and they are obliged to stop working and rest for a while in a cooler spot. A rapid enervation compels frequent changes of the men in the gallery, and sudoral or miliary eruptions occur, sometimes boils, rarely eczema. If, while the gallery is constantly damp, the air is vitiated by poisonous or irrepressible gases, and if the water contains sulphates or sulphuric acids in solution, the men, in addition to pains in their limbs and difficulties in breathing, experience lively itches and painful smarts wherever the surface of the skin has been abraded. Those who have labored for a long time in the damp galleries contract a chronic inflammation of the gums, together with muscular pains in the limbs, and have often intestinal troubles and spots of purpura. These phenomena indicate the coming on of a mild form of scurvy. The remedies are improvement of the sanitary conditions of the mines and the homes of the miners, and the usual applications for scurvy whenever the symptoms of that disease appear.

**HOT WATER IN COAL MINES.**—The borough of Shenandoah, Schuylkill County, is greatly excited over the presence of hot water in one of its seven coal mines, and apprehensions are entertained that the colliery is on fire. As a precautionary measure, a watch is constantly kept in the lowest lift for any sign of fire; but up to the present, with the exception of the warm water, no cause for alarm has been discovered. The foreman of the colliery stated that he never knew water, found under the circumstances above stated, to have been heated except by fire. Several experienced miners who have visited the mine state their unbelief in the existence of a fire, but can give no satisfactory reason for the presence of the heated water. Warm water has of late been found in one of the workings of Turkey Run colliery also. This colliery is located at the southeastern boundary of the town and west of Shenandoah colliery. The workings are unconnected. Turkey Run is also operated by the Philadelphia & Reading Coal and Iron Company. The officials at this colliery are just as much in the dark relative to the cause of the strange presence

as are those at Shenandoah colliery. A solution of the mystery is anxiously awaited at Shenandoah, and may be expected in a week or ten days.—*Reading (Pa.) Times*, March 9.

### GENERAL MINING NEWS.

#### ARIZONA.

The Tombstone *Epitaph* says:

**GRAND CENTRAL.**—The north drift in the west vein, 300-foot level, is pushing ahead rapidly, making 25 feet since last report. This drift now discloses a solid body of high-grade ore from 5 to 19 feet wide and 240 feet in length, the face being in about 12 feet of ore. The main shaft is down 395 feet, in very hard rock, making progress slow.

**HEAD CENTER.**—Work, which has been suspended for a short time pending the completion of the hoisting-works, will be begun again on February 28th, by the opening of the different stations and preparations for extracting ore. Meanwhile the company's mill is crushing ore from the dump which accumulated while the mine was opening. The new hoisting-works are nearly completed. The machinery is a magnificent piece of work, of about 150 horse-power, and has capacity to work the mine to a depth of from 1800 to 2000 feet. The double engine is in pattern half Corliss and half poppet-valve, with a new patent cut-off which greatly economizes steam when but little power is needed. It is the only hoisting-engine in Arizona which is direct-acting, doing entirely away with the cog-wheel gearing, and therefore running almost as silently as a clock. The cylinders are 12 x 60-inch, giving a 5-foot stroke, and the steam is generated in a 16 x 4½-foot boiler.

**TOMBSTONE COMPANY.**—The face of the drift from the bottom of the new winze on the 250-foot level of the Tough Nut is all in ore of a high grade. The new drifts north and south from the bottom of the old northwest vein are also all in ore. The company will soon have the machinery in the new hoisting-works in place.

**VIZINA.**—The main shaft is 218 feet deep. The bottom gives evidence of being nearly through the limestone, talc and quartz beginning to show in considerable quantity. The two prospect-drifts on the 100-foot level are pushing ahead rapidly, and are looking favorable. Considerable ore is extracting from the Amm incline, and the daily output of the mine, from development-work, is about 15 tons. The mine is looking exceedingly well.

#### CALIFORNIA.

##### THE BODIE DISTRICT.

The many Eastern stockholders of the Bulwer Consolidated will be glad to learn that the mine is showing considerable improvement in the west cross-cut from the south drift in the Ralston vein, in the 200-foot level. Proposals are advertised for sinking a shaft on the South Noonday. The new pumping machinery on the Red Cloud was started on February 26th. The Bodie *Free-Press* reports the bullion product of the district for the month of February at \$321,265.33. The Black Hawk, South Bulwer, Goodshaw, Oro, Red Cloud, Noondays (Combination), and Boston Consolidated are still sinking. One bob-station and two tanks are in course of excavation in the Lent shaft, which necessitates the suspension of sinking for the present. The Goodshaw shaft will be pushed down to a depth of 750 and the South Bulwer shaft to 800 feet.

Below will be found reports of mines named for the week ending February 26th, as given in the *Free-Press* of the 1st inst.:

**BODIE CONSOLIDATED.**—For the week ending February 26th, the work done in the mine was as follows: The west cross-cut, sixth incline level, was advanced 16 feet, making its total length 55 feet. The vein has greatly improved since last report, and now shows assays of \$90 from average samples where the vein is one foot thick. The south upraise from the fifth incline level has been raised eight feet, making the height above the vertical upraise 74 feet. The vein has not changed in any respect since last report. The north drift on the Vulcan vein has been driven seven feet, and the south drift nine feet. In both drifts, the ore-streak is from two to three inches wide. The ore for the past week has yielded \$59.70 per ton, but the appearance of the stopes indicates that it will be higher for the coming week.

**BODIE TUNNEL.**—Extracting ore from both the north and south drifts, tunnel level, in the Feoston or No. 20 vein. The ore is transported to and reduced by the Miner's mill, and is giving satisfactory returns. The ore-breasts are looking well in both drifts.

**BOSTON CONSOLIDATED.**—The main shaft was sunk five feet during the week; total depth below the 300-foot station, 27 feet. The east side of the shaft is cutting into the foot-wall rock of the vein, and the ground is breaking well. The north drift on the 300-foot level has been advanced five feet; total length, 330 feet. This drift is now partially in the vein, and is getting some seepage water. The quartz exposed by the drift is of a very favorable character. The stopes on the 200-foot level are looking well. Hoisting some ore from this point when not otherwise engaged in hoisting from the shaft and level below.

**BULWER CONSOLIDATED.**—The west cross-cut from the south drift on Ralston ledge, 200-foot level, is now in 61 feet; progress for the week, 15 feet. There is a noticeable improvement in the formation through which this cross-cut passed during the week.

**CONSOLIDATED PACIFIC.**—The north drift on Pacific Lode No. 1 has been advanced five feet; total length north from cross-cut, 21 feet, carrying a vein from two and a half to three feet in thickness of high-grade ore, much of it showing free gold. The west cross-cut, 504-foot level, is now in 31 feet west from the station. The west cross-cut, 600-foot level, has been advanced five feet; total distance west from station, 97 feet, still cutting through the same character of porphyry as heretofore reported.

**GLYNN-DALE.**—Still drifting north and south in a very fine character of ground; progress for the past week, 18 feet. The formation is more favorable, and the machinery and every thing about the mine is in good order.

**GOODSHAW.**—Sinking the main vertical shaft, which is now down 28½ feet below the 600-foot level station, 19½ feet having been added to the depth of the shaft during the past week. The shaft will be pushed to a depth of 750 feet before again cross-cutting.

**NOONDAY.**—The 212 and 312-foot slopes show no change since the report. The 412-foot slope continues to be free from waste, and the ore is of fine quality. Drifting south on the west prong of vein No. 1 on the 412-foot level. The face of the drift is 606 feet south of the shaft. At a point above this, on the 312-foot level, the vein was quite small. The No. 1 south drift, 512-foot level, was extended 13 feet during the week. The drift is in a very large body of quartz and clay. Now running diagonally for the foot-wall. The combination shaft is 49 feet below the 512 station, 15 feet having been sunk during the week.

**SOUTH BULWER.**—A larger engine and a new pump are on the road from San Francisco for the South Bulwer, and the sinking of the main vertical shaft will be vigorously prosecuted until the 800-foot level is reached.

**SYNDICATE.**—Still stopping and milling ore from the 300-foot level, Osceola vein. It is expected, however, that prospecting work will be resumed on the 950-foot level within a few days, and the cross-cut on that level pushed to the Osceola vein.

#### COLORADO.

##### GILPIN COUNTY.

We are indebted to the *Register-Call* of late dates for the following information:

The United Gregory Mining Company is repairing two of the boilers in its 50-stamp mill, consequently it is only running 25 stamps this week.



The superintendent of the New York & Colorado Company's property is driving the 800-foot east level. Prior to sinking the working-shaft, it is the intention of the management to place a walking-beam in the shaft, to facilitate the handling of the water raised by means of a Cornish pump. Thirty stamps of the company's mill are employed in crushing ore.

The Consolidated Kansas Mining Company's mill, in Nevada, is idle. The manager of the company is placing new pump connections in the mine, and it is expected that the mill will start up again next week.

The crevice-matter in the Rara Avis has changed very materially in sinking the last few feet. The mineral is coming in in better shape—that is to say, it is more closely confined.

LAKE COUNTY.

The Leadville *Herald*, speaking of the prospects of that camp and its mines during the coming season, says:

Fryer Hill is the only location that has shown any evidence of weakening, and this hill, the most wonderful ever known in the world, that has produced about twenty millions of dollars, is yet far from exhausted. The Chrysolite today shows more ore exposed than it did last June, though since that time nearly a million dollars' worth of bullion has been taken from its workings. The Little Pittsburg, pronounced exhausted, has steadily kept up an output of ore and has developed several new bodies. The other mines over the hill, including the Amie, Dunkin, Matchless, Lee, and Hibernia, have had their ups and downs, but continue to produce and will average as well as they did a year ago. What is to give prominence to Leadville is the fact of the new discoveries being made and that have been made on Yankee Hill to the east and south. The Denver City, Little Sliver, and others have proved that the ore-deposit extends through Yankee Hill as it has done on Fryer, and opens an immense tract of mining ground, all of which will soon be productive.

Carbonate Hill, also, instead of simply having a contact around its side extending into the hill for but a short distance, as was first supposed, is proving to have ore in nearly all portions of it. The Glass-Pendery workings, which have produced an immense amount of ore, are below the ore-belt, and again beyond or higher on the hill the ore-body is known to exist. In the Big Chief, it has been reached, and the Brookland, Agassiz, and others show strong evidences of nearing ore. When these shall be sunk to the ore-body, a new impetus will be given to mining and developments.

Iron Hill has constantly improved, the Silver Cord and Silver Wave are large producers, and the Iron mine was never shipping as much ore as at present. The developments as far up the hill as the Tucson, fourteen hundred feet from where the ore was first found in the Iron, prove the vast extent of the ore-deposit.

The best evidence of the prosperous condition of the camp is the large ore-shipments continually made. These show no evidence of failing, and the certainty which exists that they will be continued can but re-establish confidence. There will probably not again soon be a great rush of people, and the wild excitement that once prevailed; but there is a certainty of a good solid business and better times than now exist.

**BIG PITTSBURG.**—A strike of great importance is reported in the Big Pittsburg. It is in the Pearson shaft, and three feet of ore are exposed. The company is pushing work, both in this shaft and the McCormick shaft.

**DUNKIN.**—The Dunkin mine, during the past month, produced 684 tons of ore.

**HENRIETTE.**—The *Democrat* of the 1st inst. says: A tour through the workings of the Henriette mine, contiguous to the lower shaft, discloses an immense amount of ore. The shaft has a depth of 130 feet, where quartzite is encountered. The last 49 feet of the shaft passed through a solid body of iron. When Professor Harker assumed charge of the property, he set his men to work driving a drift on the top of an iron ledge, 90 feet from the surface. The drift was run to the line of the Half-Way House lode, passing through medium-grade ore, a distance of 22 feet. It was then extended eastward, in lead carbonate ore, on the iron bed, which makes a slight pitch to the east, until now it has attained a length of 140 feet, showing an unbroken body of ore the entire distance, averaging about 8 feet in thickness, and running 45 ounces in silver and from 30 to 40 per cent in lead. The face of the incline still shows a fine breast of ore, about 11 feet in thickness. Parallel with this incline, another has been driven, starting from the shaft and running east. This is 22 feet from the incline above mentioned, and has a length of about 100 feet, leaving four fine blocks of ore standing. The mineral is sand carbonate, with lumps of galena interspersed, and presents a magnificent appearance. The thickness averages from six to seven feet. The roof is porphyry, and the bed of the mineral is a solid, unbroken mass of black iron, containing some silver and lead, but scarcely enough to make it a paying grade at present. The mine has a small shaft-house and baby hoister, and employs only 28 men, nevertheless the shipments of ore range from 35 to 40 tons per day. The course of the present workings is directly for the upper shafts on this claim, which are nearly a thousand feet distant.

**IRON SILVER.**—It is extremely probable that the Iron Silver, the Silver Wave, and the Silver Cord properties will soon be consolidated in one vast company.

**LITTLE PITTSBURG.**—The Little Pittsburg mine is again at work. The Leadville *Herald* of the 3d inst. says of the present condition of the mine: The Little Pittsburg strike, made some weeks ago in the Dives ground, was looked upon as the most important event that had happened in Leadville for a long time, and so it seemed. Ten feet of solid ore of a high grade could not but create a belief that a wonderful ore-body had been uncovered. Much as the *Herald* regrets the statement, however, the fact is undeniable that this has proved but an extensive pocket of ore, that shows strong signs of giving out. To the southeast only is ore left, and here it has narrowed down to two feet. The north side of Fryer Hill is known to be pockety, from developments already made in the Chief and Chrysolite, and therefore many more important pockets like the one just found are likely to be discovered. It is, however, a disappointment that the ore-body was not found continuous. One thing that is encouraging is, that in the direction where the ore still extends the company has a large extent of territory as yet unexplored. While the present showing is not what was expected, there is yet every reason to believe that new ore-bodies will be soon discovered, and the property stands in a much more favorable light than it did before this strike was made.

MONTANA.

From the Butte *Miner* of late dates we condense the following:

**ALICE.**—No new developments are reported, but all the ore-faces and bodies of ore present their customary fine appearance. In all the upper levels, work is pushed ahead in a satisfactory manner, and about 80 tons of ore, of good quality, are hoisted daily. At the 700-foot level, a larger volume of water was temporarily encountered lately, but it abated without calling into requisition the full capacity of the pump, and it is now under easy control. Work of pushing the drifts ahead at the 700-foot level goes on daily. Satisfactory headway is made.

BLUE WING DISTRICT.

Work is not pushed with any remarkable degree of vigor at present. There is some work going on, and the prospect that the old district will revive to its former prosperous condition is quite favorable.

NEVADA.

BRISTOL DISTRICT.

**RAYMOND & ELY.**—The *Pioche Record* says: The deed from the sheriff of Lincoln County to Lazard Freres, of the Raymond & Ely real estate, mine, hoisting-works, etc., will be given on Thursday next, March 3d, unless redeemed by the stockholders previously to that date.

COMSTOCK LODGE.

The Virginia City *Enterprise* says: No matter what may be said or preached to the contrary, should a real bonanza be cut into in one of our leading mines, in

ten hours after the receipt of the news of the new birth, San Francisco would be in a regular old-time commotion, and would out-hum any Broddingnagian beehive ever heard of, while here the old good times would drop down upon the town and take lodgings in the hearts of the people in about ten minutes. Those who are now going about in the lowest levels of despondency will yet wake up one of these fine mornings to find the town in a grand commotion. Had silver veins heretofore been naught but bonanza from top to bottom, and end to end, the word bonanza would never have been heard in connection with mining. In the great bulge of the vein toward the north end we shall yet see a bonanza uncovered. The vein itself is there of greater width and strength than at any point heretofore explored, and the whole mass being fertile, a grand agglomeration of metal must sooner or later be found in some part of it. The Union shaft is making fair progress, but the bottom is just now in rock of a nature so tough that it is hard to blast. It does not break well. It is like trying to shatter a mass of lead. At the Sierra Nevada, a considerable amount of good ore is in process of extraction, with a chance of finding still more at some point in the levels now opened. A station is cutting the 2700 level at the bottom of the big joint winze of the Ophir and Mexican, and from this a drift will shortly be started northward. No drilling has yet been done from the bottom of this winze. The drill-hole mentioned last week was from the end of the Ophir Mexican west cross-cut on the 2500 level. Underground operations have been resumed at the Hale & Norcross, and early next week they will start up their main pumps. This will allow of the bailing-tanks being taken off at the Chollar-Norcross-Savage shaft, and of the putting on of the hoisting-cages, when work may be resumed at the south drift, on the 2400 level of the Potosi. The south branch of the Sutor Tunnel, and the north drift from the Yellow Jacket shaft, are fast approaching a connection. When they begin sending water through into the Sutor Tunnel, the Jacket, Belcher, and Crown Point will again come to the front. At the south end, the Alta folks are pushing their shaft down at a rapid pace.

UTAH.

BINGHAM DISTRICT.

The Salt Lake *Tribune*, in speaking of the mines of Bingham, says: Many rumors are afloat of various properties about to start up, but we can not look for any great rush of operations until the snow settles and the roads become passable. Work has been commenced at the Hooper and Last Chance. The tunnel of the Deal mine is in 200 feet. It is thought that the tunnel will cut about 25 feet below the present depth of the shaft. The vein is well defined, and about 6 feet wide between walls. This is one of the most promising pieces of property in the cañon. The Tiewaukee is closed down for the present, owing to litigation with the Accident. The Thrush, Pet, and a number of other claims are all worked, and business throughout the cañon is said to be steadily on the increase.

PARLEY'S PARK DISTRICT.

**EMPIRE.**—The Park *Mining Record* says: Work has been resumed at this mine, and a force of twenty-five men was busy all week grading for a new boiler-room, to be 40x60 feet. It will adjoin the old boiler-room on the north. A large amount of rock had to be removed. Four of the mill-boilers will be brought up. The water in the shaft will be lowered immediately below the 300 station, and work resumed on the ore-bodies. As soon as the new boilers are ready, the water will all be tanked out, and the vein on the 400 opened up.

MARYSVALE DISTRICT.

From a letter written to the Salt Lake *Tribune*, we condense the following: The Deer Trail mine made a flattering discovery in the old workings, near the south end, on the 23d of February. The discovered vein is said to be 16 inches thick. The Crystal mine has several car-loads of shipping ore out, but the snow in the cañon is too deep and heavy to get it down where wagons can load it. The 500-foot tunnel of the Clyde mine is pushed ahead at the rate of 10 feet per week. It is thought that the tunnel will tap the ledge 500 feet deep.

PROPOSALS AND SALES.

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:

Furnishing Galvanized Iron Clamps, etc., and Beam Slate, and for laying all the Bricks required for the Arches during the present year; also for the Coal that may be required during the year 1881; Commissioners of Public Buildings, Penn Square, Philadelphia, Pa.	March 15, 1881.
Designs for a Cotton Exchange to be erected in the City of New Orleans; the sum of \$1000 will be paid for the Drawings chosen, the Association reserving the right to reject any and all plans submitted. A circular giving particulars and explanation, together with ground-plan and sketch-plans suggestive of divisions of the various floors, etc., will be furnished on application to Henry G. Hester, Secretary of the New Orleans Cotton Exchange, New Orleans, La.; Thomas D. Miller, Chairman Committee on Buildings.	" 15, "
Furnishing Materials and Labor necessary to the Construction and Final Completion of the Water-Works of the City of Springfield; Trustees of Water-Works, Bowman's Building, Springfield, O.	" 16, "
Printing the Minutes and Documents of the Common Council for the year 1881, in accordance with the specifications on file in Department of City Works; John French, Commissioner of the Department of City Works, Municipal Building, Brooklyn.	" 18, "
Furnishing Supplies for Keeper of Municipal Buildings, Brooklyn, for the year 1881; John French, Commissioner of the Department of City Works, Municipal Building, Brooklyn.	" 19, "
Constructing the Sunflower Extension of the Greenville, Columbus & Birmingham Railroad from Stoneville to the Sunflower River, twenty miles; Bids will be received separately for the Grading, Bridging, Cross-ties, and laying Track, or for the entire Work, the Iron alone being furnished; H. T. Irish, Secretary, Greenville, Miss.	" 21, "
Designs for Statuary to be placed on the Four Pedestals at Blackfriars Bridge; the designs may be submitted either by drawings or models; if by drawings, to be either in chalk, charcoal, pencil, ink, or sepia; if by models, in clay, plaster, or other convenient material; the designs in either case to be prepared to a scale of one inch and a half to the foot; Architect's Office, Guildhall, London, England.	" 21, "
Monument to be Erected in Rome for late Victor Emanuel II., First King of Italy; President of the Royal Commission, Cairoli, and the Secretary of the Royal Commission, etc., Rome, Italy.	Sept. 21, "
Enlarging Rooms in the Municipal Building, Brooklyn.—On March 17th, the following proposals were publicly opened and announced for enlarging the record room of the Tax Collector in basement of Municipal Department Building, as follows: William Ovington, \$420; sureties, E. J. O'Flynn, C. H. Richmond. K. A. Murphy, \$398.90; sureties, John H. Farrell and H. McLaughlin.	

**Canada & Atlantic Railroad.**—A recent report states that the directors of this railroad have concluded the contract for the construction of the road by D. C. Lindsey, of Burlington, Vt., who guaranteed to build the entire road by 1883, a distance of 122 miles, thus insuring the completion of the route from Ottawa to Boston in three years.

**Contracts for Street Work in Philadelphia.**—Bids were opened, March 8th, for certain works upon the public streets, and the papers were referred to a committee to be scheduled, the awards to be made to the lowest bidders.

**New York & New Haven Railroad Company.**—This company has just made a contract with the New England Car Company for the adoption of its patent screw lever dump-car.

**Central & South American Cable Company.**—The Colombian government has made a contract with the Central & South American Cable Company for a cable north and south from the Isthmus of Panama to connect with the United States and Europe, via Central America and Mexico.

## FINANCIAL.

## Gold and Silver Stocks.

NEW YORK, Friday Evening, March 11.

The mining share market has not lacked animation during the week under review, but has been without any special excitement. The sales have been liberal, and there is a very liberal interest being shown in this class of investment or speculation.

Alice has been quiet and a little weak; the sales amount to 1000 shares at \$7.75@ \$7.25. As compared with past weeks, Amie has had but a moderate business, while prices have been about steady; the sales aggregate 36,450 shares at 53@50c. Argenta has only been dealt in to the extent of 300 shares at 25@18c. Barbee & Walker records sales of 200 shares at \$3.25. Belle Isle has been quiet and steady with sales of 950 shares at 60@55c. Bodie has been a little weak but gained at the close; the sales amount to 1135 shares at \$6.25@ \$5.50@ \$6.25. Breece shows some improvement under a small business, the sales amounting to 700 shares at \$1.40@ \$1.65. California has been quiet with an inclination to strength; the sales aggregate 5015 shares at 89c.@ \$1. Chrysolite, although somewhat irregular, has been very strong, and has had liberal dealings; the sales aggregate 23,970 shares at \$6.25@ \$7.13. Climax has had a moderate business at steady prices, the sales amounting to 4700 shares at 56@60c. Copper Knob records sales of 6100 shares at 6c. Consolidated Virginia has been steady under a moderate business, the sales aggregating 6625 shares at \$1.50@ \$1.65@ \$1.55. Dunkin has had a moderate business at prices a little weak, the sales amounting to 7450 shares at \$1.85@ \$1.60. Deadwood has been dealt in to the extent of 100 shares at \$11. Eureka, although quiet has been exceedingly strong, the sales amounting to 445 shares at \$24@ \$26.50. Excelsior has been very quiet, with sales of 20 shares at \$6. Findley has been dealt in to the extent of 4800 shares at 29@27c. Gold Stripe has had a moderate business at fairly steady prices, the sales amounting to 3700 shares at \$3@ \$2.85. Grand Prize has been quiet and a little weak, the sales amounting to 600 shares at \$1.25@ \$1. Great Eastern has had a moderate business at steady prices, the sales amounting to 47,500 shares at 28@32c. Green Mountain has been quiet and firm, but weak at the close; the sales aggregating 2200 shares at \$6.75@ \$6. Hibernia has been very active, but somewhat irregular; the sales amount to 191,500 shares at 59@71@65c. Horn-Silver has shown more activity than for a long time past, although at weaker prices; the sales amount to 4080 shares at \$11.50@ \$10. Hukill has been quiet and weak, the sales amounting to 7700 shares at \$1.50@ \$1.30. Independence has been about steady under a small business, the sales amounting to 3900 shares at 37@40c. Leadville shows considerable strength under an improving business; the sales amount to 2860 shares at 70@78c. Little Chief has had a moderate business at irregular prices; the sales amount to 13,100 shares at \$1.70@ \$1.45. Little Pittsburg has had a fair business at irregular but weak prices; the sales aggregate 12,920 shares at \$4@ \$3.25. Moose has been active and a shade weak; the sales aggregate 41,840 shares at \$2.05@ \$1.60. Northern Belle has been quiet, with sales of 60 shares at \$13.50. Northern Belle Isle records sales of 300 shares at 30c. Ontario has been dealt in to the extent of 650 shares at \$36@ \$36 1/4. Plumas has been quiet but very strong; the sales amount to 1165 shares at \$1.75@ \$2.50@ \$1.90. Rising Sun has had a fair business at about steady prices; the sales amount to 1700 shares at \$3@ \$2.90. Robinson Consolidated has been quiet and steady, with sales of 1300 shares at \$8@ \$7.75. Starr-Grove has been quiet and strong, the sales amounting to 1100 shares at \$4.50@ \$5. Spring Valley shows a larger business than for some time past at steady prices; the sales aggregate 1915 shares at \$2.90@ \$3. Standard has been quiet but strong, with sales of 3035 shares at \$25@ \$26 1/4. Tombstone has been dealt in to the extent of 200 shares at \$6. Stormont has been very quiet and weak, with sales of 700 shares at \$2.25@ \$2.10. Yellow Jacket records sales of 100 shares at \$2.90.

Alta-Montana has been quiet and weak, the sales amounting to 1150 shares at \$2.30@ \$2.05@ \$2.25. American Flag records sales of 8200 shares at 28@ 24c. Bechtel Consolidated has been quiet and steady, with sales of 900 shares at 58@60c. Bald

Mountain records sales of 10,800 shares at 12@11c. Bonanza Chief has been steady, with sales of 5400 shares at 30@31c. Bull-Domingo has been quiet and weak, the sales amounting to 2900 shares at \$3.55@ \$3.25. Boulder Consolidated has been quite active, with an inclination to strength; the sales aggregate 26,050 shares at 55@74c. Boston Consolidated has had a moderate business at steady prices, the sales amounting to 5800 shares at 81@70@80c. Buckeye has been dealt in to the extent of 12,800 shares at 23@19c. Bullion records sales of 100 shares at 70c. Bulwer has been quiet and steady, the sales amounting to 1130 shares at \$1.90@ \$2.10. By-and-By records sales of 1000 shares at 12@15c. Calaveras has had a fair business at weaker prices; the sales amount to 14,990 shares at 23@21c. Caledonia, B. H., records sales of 550 shares at \$1.90@ \$2.65. Central Arizona has been quiet and a little weak, with sales of 900 shares at \$5.25@ \$4.75. Cherokee has been dealt in to the extent of 1700 shares at \$2.15@ \$2.10. Consolidated Imperial records sales of 500 shares at 13c. Consolidated Pacific has been quiet and irregular; the sales amount to 800 shares at 70@85@79c. Dahlenega has ranged between 8@7c., with sales of 5500 shares. Durango has had a moderate business at steady prices, the sales amounting to 4800 shares at 17@15c. Goodshaw has been quite strong, under a small business, the sales amounting to 2450 shares at 51@74c. Granville has had a fair business at 4@3c., with sales of 19,300 shares. Iron Silver has been steady at \$3.70@ \$3.65, with sales of 950 shares. Lacrosse has been dealt in to the extent of 10,300 shares at 28@26c. Gold Placer records sales of 100 shares at 40c. Lucerne has ranged between 11@9c., with sales of 18,400 shares. Mariposa Preferred has been quite strong, with sales of 1100 shares at \$6@ \$6.75@ \$6. The Common stock has been very active, and also strong; the sales aggregate 7428 shares at \$5.50@ \$4.40@ \$4.70. Mineral Creek has been irregular, under a moderate business, the sales amounting to 13,300 shares at 26@42@33c. Miner Boy has had a very liberal business at quite strong prices, the sales amounting to 28,400 shares at \$1@ \$1.55. Moose Silver only records 200 shares at \$2. Navajo has been quiet with sales of 2910 shares at \$2.15@ \$2.65@ \$2.45. North Standard has been quiet and weak with sales of 6400 shares at 25@21c. Quicksilver Preferred has ranged between \$62 3/4 @ \$61, with sales of 500 shares. The Common stock has been quiet, with sales of 400 shares at \$15 1/2 @ \$15 @ \$15 1/4. Rappahannock has been dealt in to the extent of 15,800 shares at 12@14c. Red Elephant records sales of 1200 shares at 30@33c. Silver Cliff has been quiet but fairly steady; the sales amount to 4700 shares at \$5.50@ \$5.13. Silver Nugget has been quite active at 10@7c., with sales of 25,300 shares. South Bulwer has been quiet, with sales of 2050 shares at 35@30c. South Hite has been quiet but strong, the sales amounting to 6250 shares at 28@45c. Sutro Tunnel has been liberally dealt in at fairly steady prices, the sales amounting to 8700 shares at \$1.25@ \$1.13. Tioga has had a moderate business at steady prices, the sales amounting to 3100 shares at 45@50c. Tuscarora has been a little weak under a fair business, the sales amounting to 10,100 shares at 35@27c. Unadilla has had a very liberal business at 16@15c, the sales amounting to 27,100 shares. Vandewater has had a moderate business, the sales amounting to 6200 shares at 50@46c. Union Consolidated records sales of 50 shares at \$7.50. Willshire has been dealt in to the extent of 2600 shares at \$1.25@ \$1.40. Catskill has been strong under a very fair business, the sales amounting to 2300 shares at \$5.63@ \$6. Glass-Pendery has been quiet but strong, the sales amounting to 700 shares at \$2.50@ \$2.15@ \$2.45. Barcelona has been steady, with sales of 8400 shares at \$1.10@ \$1.35. Carbonate Hill records sales of 10,000 shares at 40c. Black Jack has been steady with sales of 2400 shares at \$1@ \$1.05. Colorado Central only records sales of 500 shares at 45c. Hortense has been dealt in to the extent of 11,800 shares at 49@60c. Empire has been quiet but steady, the sales amounting to 750 shares at 70c. Big Pittsburg has been receiving a little attention during the last few days, the sales amounting to 3800 shares at \$2.15 @ \$2.50. Legal Tender records sales of but 200 shares at \$3@ \$2.50. Noonday has been dealt in to the extent of 50 shares at \$2; Allouez, 50 shares at

\$4; Head Center 1400 shares at \$4.10@ \$4; Battle Creek, 300 shares at \$1@90c.; and Cheyenne, 900 shares at 70c.

## UNLISTED QUOTATIONS.

Mr. L. V. Deforest, No. 70 Broadway, under date of March 11th, 3 P.M., reports the current quotations of unlisted stocks as follows:

	Bid.	Offer'd		Bid.	Offer'd
Barcelona.....	\$1.25	\$1.30	O. K. & Winne-		
Breece.....	1.60	1.70	bago.....	1.00	
Bald Mountain..	.09	.11	Patagonia.....	.75	
Carbonate Hill..	.50	.50	Plata Verde.....	2.50	
Empire, Utah..	.70	1.00	Rico.....	1.50	
Freeland.....	1.75		Sacramento.....	1.50	
Grand View.....	.70		Santa Cruz.....	.75	
Highland Chief..	8.00		Sir Rodr'k Dhu..	.15	
Julian.....	1.00	2.00	Stormont.....	2.25	2.50
Lowland Chief..	.25		Silver Nugget..	.07	.08
Native Silver..	.50		Vandewater G..	.46	.48
New Philadel..	.25		Con. Arizona.....	2.00	
North Hite.....	.75				

The Dardanelles Consolidated Gravel Mining Company, we are informed, will have its stock listed upon the New York Mining Stock Exchange some time during the coming week.

The Silver Nugget Company appears to be getting into better shape. If the mine will come to the rescue and help the officers out of their troubles, the stockholders can be congratulated.

We call attention to the card of Prof. Theodore B. Comstock, which appears in another column. He has shown us plans of the mine with a statement of its past history and present prospects. The enterprise as laid before us, and subject to further examination, is worthy the attention of capitalists.

It is said that the Great Eastern Company has disposed of the 50,000 shares of stock it had for sale, and is now in a position to go to work on its original plan. It has developed a large body of payore, and Mr. Dorrington, the resident director, will leave this week for the Black Hills and personally superintend the proposed extended system of operations.

The Wood River and Sawtooth mining districts, of Idaho, are among the most attractive of the many promising mineral-producing regions of the West. It is said that within the past six months over fifteen hundred mineral locations of claims in this section have been recorded, and the coming spring promises a heavy migration in that direction. All reports go to confirm the great richness of the ores of that locality. We have lately seen the milling returns of a large lot of ores from the Columbia and Beaver mines of the Sawtooth District, and worked at the New York Metallurgical works. Two grades of the Columbia ore were worked, giving respectively \$553.67 and \$416.06 per ton; and the ore of the Beaver returned \$403.32 per ton. This milling test has been one of the most thorough and complete of any made of the ores of the Idaho country. The ores carry a ruby or antimonial silver, with some gold. These most promising mines are the property of L. D. Cortright & Co., 18 Wall street, and are not in the market.

## The Tribune says:

The trustees of the Stormont Company have issued a call for a stockholders' meeting, to be held March 31st, for the purpose of voting on a proposition to increase the capital stock from 150,000 to 200,000 shares. The secretary of the company stated yesterday that the annual report published in January at the time of the change of management showed that the company was then in debt about \$75,000, and that this debt still remains about the same. The trustees and a number of the larger stockholders have been in conference in regard to the matter, and have decided that the best plan for putting the company in good financial condition was to take advantage of the present low capitalization, and issue 50,000 new shares. Owners of more than 100,000 shares have already been consulted, and are unanimously in favor of this plan, and they stand ready to take such a portion of the new issue as the directors may desire to sell at present market prices. By this means the company would begin the month of April free from debt, with a considerable sum of money and a large block of stock in the treasury, would be in condition to resume dividends as soon as work again begins, and the prosperity of the enterprise would be insured.

The American Mining Exchange, with the approval of the Mining Trust Company, has listed a large number of railroad and miscellaneous securities, some of which are not now dealt in on any of the New York Exchanges. It is believed that this action on the part of the Exchange will be a great convenience to the public, at the same time adding largely to the business of the Exchange. Other important plans looking to the advancement of the interests of the Exchange are now under discussion by the proper committees in conjunction with the Trust Company, full details of which will be given to the public at an early day.

## OFFICIAL LETTERS.

Great Eastern.—The superintendent of the Great

GENERAL MINING STOCKS.

Dividend-Paying Mines.

Table listing mining companies with columns for Name and Location of Company, Feet on Vein, Capital Stock, Shares (No. and Par Val), Assessments (Total levied to date and Date and amount per share of last), Dividends (Total paid to date and Last Dividend), Highest and Lowest Prices per Share at which Sales were Made (March 5, 7, 8, 9, 10, 11), and Sales.

Non-Dividend-Paying Mines.

Table listing mining companies with columns for Name and Location of Company, Feet on Vein, Capital Stock, Shares (No. and Par Val), Assessments (Total levied to date and Date and amount per share of last), Dividends (Total paid to date and Last Dividend), Highest and Lowest Prices per Share at which Sales were Made (March 5, 7, 8, 9, 10, 11), and Sales.

g. Gold Silver s. 1, Lead. c. Cop per. \*Non-Assessable. †The Deadwood mine paid in dividends, previous to the consolidation, \$27 000. Total shares sold during the week, 810,818.

Eastern telegraphed yesterday morning as follows: Struck good pay-ore in Shepp tunnel. Have 400 feet of track to lay and chute to build. Will start in ten days. This tunnel is right under the old workings where the mine caved, and this strike proves that the old ore-body has at least fifty-four feet in depth.

**Gold Stripe.**—Gold Stripe is reported to be showing fine developments. Increased ore-reserves have been exposed by the winter's work. The mill is running steadily.

**Green Mountain.**—It was officially telegraphed on March 2d that the Green Mountain mine was in fine condition, and that the mills were running on full time.

**Little Chief.**—The manager reports the recent strike as holding out well, having been followed into the porphyry dike 30 to 40 feet. The ore-body is said to have undergone no material change, and is not any thicker than when first discovered.

**Hukill.**—A recent dispatch says: The Hukill mine employs only twenty-three men at the present time. The principal work of development at present in progress is the running of a drift under South Clear Creek, to connect the Delano shaft with the old workings. The drift runs about 200 feet below the level of the creek. There are now, it is reported, about 2000 tons of concentrated ore on the dump, which will average about \$30 per ton in gold, silver, and copper. It is a matter of general regret in the district that the Hukill is not more extensively worked.

**Miner Boy.**—A telegram of yesterday, from the manager, says: One-hundred-foot level struck ore last night that will run very high; mill running all right; mine improving daily.

**Robert E. Lee.**—LEADVILLE, COLO., March 4.—The Robert E. Lee mine, visited to-day, shows large ore-bodies to the east, toward the Little Sliver mine; also a large and rich ore-face in the south drift, toward the Matchless. The new shaft has attained a depth of 182 feet, and will soon make connection with a drift running northward from the old workings.

**Silver King.**—A dispatch dated San Francisco, March 10th, to the *Tribune*, says:

An official letter from the Silver King mine says that the mill resumed work on Monday, and that three roasters, two new, will be in full operation this week. The superintendent claims to be able to produce \$25,000 to \$30,000 weekly. Some 6000 tons of ore are on the dumps. The shaft is sinking below the 500 level in first-class ore. The cash balance of the company on March 1st was \$47,000.

**Standard Consolidated.**—The superintendent reports, under date of February 28th, that the total length of east cross-cut, 1000 level, is 131 feet. The west cross-cut, same level, is now in 83 feet, in good formation, the water-flow continuing strong. The main east cross-cut, 700 level, is in 53½ feet. The total length of south drift from east cross-cut, 500 level, is 156 feet; the ledge here is about 4 feet wide, and looks well. Upraise No 6 from north drift 385 level, is up 135 feet, showing a strong vein of about 20 feet of ore. The total height of Upraise No. 1, south drift, is 248 feet, showing ledge 15 feet wide. On the 550 level, the ledge in the stope is 25 feet wide, of clean ore. On the 385 level, north, the ledge is from 12 to 18 feet wide; in the south end, the vein is from 7 to 10 feet wide. The mills are all running steadily, and every thing around the mine is working well.

**Starr-Grove.**—A dispatch dated Battle Mountain, Nev., March 9th, says: The Starr-Grove Company is working both mills and mine. The Miners' Union has collapsed, and there has been no trouble.

DIVIDENDS.

The Indian Queen Mining and Milling Company has declared its tenth monthly dividend, two per cent upon the par value of the stock, payable March 19th, at the office of the company, No. 7 Exchange Place, Boston. Notwithstanding the fact that February is a short month, and also, that the mill was stopped several days for repairs, the net earnings were far in excess of the regular dividend, and a considerable surplus will remain in the treasury.

The Deadwood-Terra Gold Mining Company, of Dakota, announces its regular monthly dividend (for February) of 25 cents per share, payable at Wells, Fargo & Co.'s on the 20th inst. Transfers will close on the 15th.

Dividend No. 65 has been declared by the Ontario Silver Mining Company, making a total of \$3,250,000 the stockholders have received in monthly installments. The February dividend is payable by Wells, Fargo & Co. on the 15th. Transfer-books close on the 10th.

The Cleveland Iron Mine of Marquette, L. S., will, it is said, divide \$30 a share among its stockholders

from its earnings for 1880. This will amount to \$600,000 on its capital stock.

PHILADELPHIA, March 8.—The Lehigh Valley Railroad Company has this day declared a quarterly dividend of 1½ per cent, payable April 16th:

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

NAME OF COMPANY	CLOSING QUOTATIONS						Open- ing Mar 11
	Mar 4	Mar 5	Mar 7	Mar 8	Mar 9	Mar 10	
Alpha.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Alta.....	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2	3 1/2
Argenta.....	10-23	10-23	10-23	10-23	10-23	10-23	10-23
Bechtel.....	1	1	1	1	1	1	1
Belcher.....	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2
Belle Isle.....	13-10	13-10	13-10	13-10	13-10	13-10	13-10
Belvidere.....	20-33	20-33	20-33	20-33	20-33	20-33	20-33
Best & Bel.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Bodie.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Bullion.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Buller.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
California.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Chollar.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Con. Imp.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Con. Pacific.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Con. Va.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Crown Pt.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Eureka Con.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Exchange.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Goodshaw.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Gold & Car.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Grand Prize.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Hale & Nor.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Independence.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Julia Con.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Justice.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Leopard.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Mammoth.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Mar. White.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Mexican.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
None.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
North Belle.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Noonday.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Ophir.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Orig. Kye's.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Ore.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Overman.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Potosi.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Savanna.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Scorpion.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Sierra Nev.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Silver King.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Se. Bulwer.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
St. Louis.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Tip Top.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Tuscarora.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Union Con.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Utah.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Wales.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
Yel Jacket.....	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

REVIEW OF THE SAN FRANCISCO MARKET.

Beyond an unusual number of assessments levied during the week, nothing has transpired to change the depression still hanging over the "Comstock." The Ophir and Union Consolidated companies have levied assessments of \$1 per share each, while Hale & Norcross and Alta demand 50c. per share from their stockholders. May Belle, Belmont, and Trojan are satisfied if they can get 10c. per share, but Caledonia wants 25c. per share. Rumors, unauthenticated, are published to the effect that important developments have been made in the Consolidated Virginia mine. The following telegrams are appended, as being of interest:

Camden, Nev., March 4.—The governor last night vetoed the bill to release the Beaman firm from penalties on withheld bullion taxes. The same bill was passed two years ago, but was held to be unconstitutional by the Supreme Court. The amount of the penalties is \$70,000. Much excitement and great rejoicing exist among the Republicans, as it was feared that Gov. Kinkaid, a Republican, would sign the bill. The legislature adjourned last night.

The Post says:

The northern branch of the Suro Tunnel was begun July, 1870, and has been carried to the middle of the Mexican mine, where the companies north of that mine ordered the work stopped, as they had in the mean time put in drain pipes to connect the same with the tunnel. All the leading mines to the north are now utilizing the main tunnel. Up to the present time, the Suro Tunnel Company has received very little income from the Comstock mines. Of the \$700,000 received during the year ending March 1st, 1880, \$321,300 came from the sale of shares, \$153,000 from lateral tunnel construction, \$150,000 from bills payable, and \$35,700 from royalty on ore raised. Two small drifts, 110 and 118 feet from the main tunnel, were run for ore in 1879, but with no satisfactory result.

The *Commercial Herald* of March 3d, says of the market:

The money market continues to be characterized by a large volume of unoccupied loanable funds, which are seeking investment upon more favorable terms than ever before known—not in the risky speculative fields for which Californians have heretofore been so well known, but in a cautious and careful manner, and in such ways as experience has taught them with means to gain advantages instead of losses. This transition from the extremely speculative ways to careful business channels is becoming quite general, and has much to do with the stagnant condition of mining stock operations and the great field collectively controlled by such operations. The result is of course harmful for the time being, but will eventually be of incalculable benefit to the entire community instead of the comparatively few who have been the sole reapers. It has been the custom for those with surplus gains to carry them to Pine Street for speedier and larger returns, and it took a long

time to convince them that it was folly to hope for any returns to outsiders except in a very few instances. It is a lesson that so far has been beneficial to all dealers upon "points" and "friendly advice," but effectual as the lesson has been—principally due to the lack of large bodies of ore in the Comstock lode—still, if any considerable amount should be uncovered the excitement and speculation would rival former days. There is no denying that the mining share market has been for years controlling our money market, and for that matter in a large measure governing our business relations, and now in emerging from this channel it works hard until other better and sounder fields of occupation are taken possession of.

Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

Boston, March 10.

There has been but very little doing in copper stocks the past week, and prices continue to drop under the influence of a tight money market. There is no great pressure to sell, but buyers are scarce, and whenever a reasonable bid is made, it brings out sellers. Even the best mines on the list have declined, until it would seem as if the bottom had been reached, and purchases made at this time must eventually pay a good profit. There is more activity in the silver stocks, but prices generally are lower. Calumet & Hecla has felt the depression in the market, and declined from \$247¼@238, closing at the latter figure asked.

Copper Falls dull and inactive at \$12¼@13¼. Franklin opened at \$15, and was quite strong in the early dealings, but finally declined to \$14. Peabody has been very dull and although but little stock has been sold it declined from \$18¼@17. Quincy declined from \$35@33½ at the morning Board to-day, and closed offered at \$33¼. Osceola, on sales of 25 shares only, declined from \$38@37.

Atlantic declined from \$16@14. Allouez quite steady on small sales at \$3¼@4. Blue Hill declined to \$4½, but sold up again to \$5, and was quite firm at that price.

The balance of the list dull and but few sales. We note: Ridge, at \$5; Huron, at \$4¼; Aztec, \$1¼; Washington, at 67¼@70c.

Brunswick Antimony declined from \$22@18¼. In silver stocks Catalpa opened at \$2¼, ex dividend, and has steadily declined to \$2; closing, \$2 bid.

Contentment steady at \$2¼. Harshaw opened at \$13¼ and declined to \$12. Silver Inlet sold at \$31, the last sale being \$30, at which the stock was offered; \$29¼ bid.

Duane Silver advanced from \$3¼@34, closing at \$34. 3 p.m.—At the afternoon Board, the market showed no signs of improvement, the whole list closing dull and at the lowest prices for the week. Peabody sold at \$17; Quincy, at \$33¼; Calumet & Hecla, \$238; Harshaw, at \$12; Catalpa, \$21-10.

At the Boston Mining and Stock Exchange, there has been a fair degree of activity in the leading specialties throughout the week. Boston Gold and Silver still continues to grow in favor, and large orders are daily received for the stock; the price has advanced from \$5.35 to \$5.50, closing to-day strong at the latter figure. Empire continues to be largely dealt in, the fluctuations in it being enough to keep up the speculation. Massachusetts & New Mexico is another favorite, and sales aggregate quite large. Dunkin is gaining in favor, and the daily dealings in this stock are increasing. The success of the Board seems to be now well assured, and continued applications for membership are received, the price of seats being now advanced from \$300 to \$500.

Coal Stocks.

New York, Friday Evening, March 11.

A t degree of activity has prevailed in this class of stocks during the week under review, with prices irregular and rather inclined to weakness. Delaware, Lackawanna & Western has absorbed the bulk of the dealings, the sales amounting to 410,638 shares at prices ranging from \$125½ to \$131. Delaware & Hudson has had sales of 70,290 shares at \$110½@115½. New Jersey Central has been active and weak; the sales amount to 123,120 shares at \$108@102½. The sales of Reading in this market have amounted to 61,735 shares at \$71@64. A dispatch from Philadelphia to-day says: In the Reading Railroad suit in the Court of Common Pleas, regarding the election proceedings in that road, argument was closed this morning, and the court announced that the orders governing the election would be made to-morrow. George M. Dallas, one of the masters under the receivership of the company, was suggested as chairman of the meeting and accepted by both sides.

The Colorado Coal and Iron Company in its statement for the year ending December 31st, 1880, reports assets amounting to \$13,120,643, and liabilities amounting to \$12,959,635, showing a balance of assets over liabilities of \$161,007. All expenditures made during the year for construction have been added to the values of the properties at the first of the year, and all sales of property have been deducted, so that the statement of assets of December 31st, 1880, shows the actual condition of the company on that date. During the year, the liabilities have been increased by the issue of \$14,325,000 of additional Central Colorado Improvement Company coupon certificates, to complete the funding of the unpaid coupons of that company, and also by the issue of \$1,225,000 of the bonds of the Colorado Coal and Iron Company. The balance to surplus fund at the end of the year, \$161,006.85, is the amount brought over



The conflicting reports of the attitude of the English and German governments on the monetary conference, and the lower rates here for sterling exchange, have materially lowered the silver market during the last two weeks, and left it only nominal at the figures of our table.

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

DATE.	LONDON		DATE.	N. Y.	
	Pence.	Cents.		Pence.	Cents.
March 5	52	*	Mar. 9	52 3/4	112 3/4
March 7	52 3/4	†	Mar. 10	52 3/4	112 3/4
March 8	52 3/4	112 3/4	Mar. 11	52 3/4	112 3/4

\* 111 3/4 @ 112 † 112 @ 112 3/4

ARIZONA.

**Grand Central Mill.**—This mill started up recently, and made its first shipment of bullion, valued at \$10,000, last week. Regular shipments will follow, it is stated, at the rate of about \$100,000 per month.

**Harshaw.**—The Hermosa mill, belonging to this company, works about 95 tons of ore per day. It is stated that nearly 30,000 tons of ore were worked last month. The mill is provided with the most improved machinery and apparatus, requiring but one fourth the usual number of hands to run it.

**Silver King.**—Recent reports state that the mills are being repaired, and consequently no shipments are reported.

CALIFORNIA.

**Calistoga.**—The Independent Calistogan reports the shipments of quicksilver for the week ending March 2d to have been as follows:

	Flasks.
Great Western Mining Co.	52
Napa Con. Mining Co.	70
Sulphur Bank Mining Co.	255

**Nevada City.**—The gold bullion expressed in February amounted to \$88,535; \$9000 less than in the preceding month.

**Standard.**—The superintendent reports that, during the week ending March 8th, 1,369 tons of ore were shipped to the mill; average pulp-assay, \$41.38. Shipments to San Francisco amount to about \$61,414.

COLORADO.

**The Register-Call,** in speaking of the February shipments of gold, says:

The gold shipments for the month of February, 1881, foot up \$63,100, as against \$107,600 for the month of February, 1880.

The shipments for January of this year were \$75,400 against \$125,000 for the same month in the preceding year. This shows a shrinkage of \$88,600 in the shipments for the first two months of 1881. When it is taken into consideration that the development of the mining industry of the county has been greatly retarded by the excessive cold and stormy winter months, and that the most productive of the mines have been developed to greater depths and the opening of new bodies of ore, the showing is not so bad as might be imagined. The shrinkage of January and February will be fully made up before the close of the year.

**Etna.**—This mine recently shipped a lot of 15 tons of carbonate, which yielded, it is said, 170 ounces per ton.

**Billing & Eilers.**—These smelting-works during the month of February, it is stated, produced 642 tons of bullion, containing on an average 233 ounces of silver to the ton, an aggregate of 149,586 ounces of silver. The shipments for February amounted to 1026 tons.

**Clear Creek.**—This company's reduction-works at Georgetown are reported to be turning out an average of three silver bricks per week, the fineness of each being about 975 and the weight from 1000 to 1200 ounces. The lixivation process is employed, and light ores of a low grade are preferred.

**Henriette.**—Reports state that this mine is yielding about 40 tons of ore daily, running from 45 to 55 ounces in silver, and carrying 22 per cent lead.

**Iron Silver.**—The secretary reports the product of this mine for February to have been 5530 tons and 280 pounds of ore.

**Little Chief.**—The manager reports that the ore-shipments for the week ending March 5th amounted to 91 tons.

**Robinson.**—During the week ending February 28th, this mine shipped 528 tons of ore.

DAKOTA.

**Caledonia.**—The manager reports that for the week ending February 28th 1383 tons of quartz were shipped to the mill.

**Homestake.**—A two weeks' run by the company's mills at Lead, Terraville, and Central, gave a result of \$225,000.

MONTANA.

**Butte.**—The bullion shipments for the week ending February 26th footed up 3300 pounds; valued at \$52,800. This is about \$12,700 above the previous week; total for the last three weeks, \$158,508.

**Gloster.**—It is stated that this mine is improving. The last clean-up was for 13 days' work, and amounted to \$2507 in gold, or \$17.60 per ton.

NEW BRUNSWICK.

**Lake George.**—It is reported that the antimony mines at Lake George are steadily worked, with good prospects for the future. The concentrating-mill will soon be running.

NEVADA.

**Northern Belle.**—This company has two mills running at Belleville; each mill works 20 stamps, with a daily crushing capacity of 60 and 150 tons. The water is brought a distance of eight miles by a four-inch pipe, and the two mills consume an average of 60,000 gallons per diem.

UTAH.

**Bullion.**—A shipment of ore of fair average quality was recently made to the Sandy Sampling mills; the ore yielded 137 ounces of silver per ton.

**Ontario.**—The manager reports the bullion shipments for the months of January and February to have been as follows:

January	\$167,824.52
February	186,130.60
Total	\$353,955.12

**Silver Reef.**—The Silver Reef Miner of February 23d

says: Bullion shipments from Silver Reef for the present month will be very light, more than half the number of stamps in camp being hung up. Not until the strike is over can we expect to see the shipments resume their healthy appearance.

MISCELLANEOUS.

**Bullion Receipts from the Mines to New York.**—The bullion received from the mines at the various offices in this city during the week ending with yesterday, as compiled from various sources, amounts to \$565,781.40, as against \$339,052.32, reported in our last.

**The Monetary Conference.**—LONDON, March 10.—The Times this morning says: A deputation of the Liverpool Incorporated Chamber of Commerce yesterday held a conference with Lord Hartington, Secretary of State for India, and presented a memorial urging the government to appoint commissioners to represent England, and especially India, at the Monetary Conference. Lord Hartington said the government was considering the matter, but that he was not prepared at present to make a definite pledge.

**The Daily Telegraph** says: Lord Hartington pointed out that there was some difficulty, owing to the terms in which the invitation of France and the United States was couched. As originally worded, it seemed to commit the governments accepting it to the adoption of bi-metalism, and an admission that the maintenance of a gold standard is impolitic. The government could not participate in any conference which assumed their willingness to abandon the gold standard. Negotiations have consequently taken place with a view to modifying the invitation, in order to permit England to accept it consistently with these reserves. England and India would willingly adopt any safe and prudent measure which might help to rehabilitate the value of silver. The deputation appeared quite satisfied with Lord Hartington's assurances.

**BERLIN, March 10.**—In the Reichstag to-day, Herr Scholz, Secretary of State for the Imperial Treasury, declared that the federal governments were resolved not to deviate from the basis laid down for coinage reform. The suspension of sales of silver did not indicate a tendency toward bi-metalism. He said Prince Bismarck was emphatically in favor of the maintenance of the status quo. The reform of coinage could only be effected with his full concurrence. The Monetary Conference at Paris was not to be an experiment by which one side would gain and the other lose, but a united agreement for averting the dangers of the future.

**LONDON, March 11.**—A correspondent at Berlin says Germany has accepted the invitation to attend the Monetary Conference, but makes the express reservation that she will not regard herself bound in any way by the decisions of the delegates.

A dispatch from Paris says the selection of Mr. Everts as chief delegate to the Monetary Conference is construed there as a sign that the United States attach great importance to the conference, and count on a more practical result than in 1869.

Exports of Gold and Silver from New York.

Week ending March 5th	\$183,327.00
Corresponding week last year	1,014,234.00
Since Jan. 1st this year	2,087,037.00
Corresponding period last year	2,384,734.00

Gold Interest Paid Out by the Treasury.

Week ending March 5th	\$1,203,371.15
Corresponding week last year	1,668,035.96
Since Jan. 1st this year	10,821,591.45
Corresponding period last year	13,193,348.79

**WASHINGTON, March 8.**—The Treasury Department has just ordered the transfer of \$4,801,937.37 of gold bullion from the New York Assay Office to the mint at Philadelphia for coinage into eagles and half-eagles.

**WASHINGTON, March 10.**—The Treasury Department to-day purchased 90,000 ounces of fine silver for delivery at the New Orleans Mint.

The Treasury Department to-day ordered the transfer of \$5,138,251 gold bullion from the New York Assay Office to the Philadelphia Mint for coinage into eagles and half-eagles.

During the month of March the United States Assay Office in New York will transmit \$20,000,000 gold bullion to Philadelphia for coinage.

METALS.

NEW YORK, Friday Evening, March 11.

The market remains very much in the same condition that it has been for some time past, featureless and inanimate.

**Copper.**—Without much doing, this metal remains steady and quiet. We quote Lake spot stuff 19 1/4 @ 19 3/4 c., futures 19 1/2 @ 19 3/4 c.; Baltimore nominal at 18 3/4 c. By cable, Chili bars are quoted at £60 15s. @ £61 for spot stuff.

Our English advices by mail include February 25th Feb. 21st. A good business in Chili Bars, mostly forward or "option" metal. Spot stuff sold at £61 1/2 @ £61 3/4 cash.

Feb. 22d. Buyers and sellers apart, and business at a complete stand-still; g. o. bs. nominal at £61 1/2 @ £62 cash.

Feb. 23d. Market without change; a warrant of g. o. bs. sold at £61 1/2 net.

Feb. 24th. Market exceedingly quiet, with sales difficult to effect at nominal values; a few cash parcels sold at £61 1/2 @ £61 3/4; tone at close weak.

Feb. 25th. Small parcels g. o. bs. sold at rather lower figures, nearly all net money; buyers at close offered £61 for cash.

Australian and English neglected; Wallaroo Cake nominal at £72; Burra, £67 @ £68; Tough Cake, £64 @ £66; Sel ot, £66 1/2 @ £68 1/2; India Sheets, £69 @ £71 1/2; Yellow Metal Sheets, 5 3/4 @ 6d. 7 lb.

**Tin.**—There is only a jobbing trade, but a good

consuming demand exists, and holders will not sell under 20c. We quote Straits, 19 3/4 @ 20c.; Billiton, 20c.; L. & F., 19 1/2 @ 20c.; Australian, 19 1/4 @ 19 3/4 c. By cable, the London quotation is £88 10s. @ £89. Singapore, \$27 1/2, with exchange at 3s. 9 3/4 d., equal to 20 1/2 c. here. The market closes steady.

Our English advices by mail include February 25th:

Feb. 21st. Market fairly active, with sales Banca at 88 3/4 @ 89s. cash; in Australian and Straits 88 3/4 @ 88 3/4 s.; final values were 88 3/4 @ 89s. usual short prompt.

Feb. 22d. With a moderate trade, Banca was disposed of at 88 3/4 s. and 88 3/4 s., and Billiton at 88s., all Dutch Warrants. Australian and Straits cash stuff sold at 88 1/2 s. prompt payment. Closing rates for cash were 88 3/4 @ 88 3/4 s.

Feb. 23d. A fall of about 6d. per cwt. induced somewhat active business; a good trade done at 88 1/2 s. sharp cash, up to 89s. for forward prompts. On second change, a quieter tone prevailed, and sharp cash stuff sold at 88 @ 88 1/2 s., closing 88 @ 88 1/4 s., with buyers at lowest.

Feb. 24th. Opening at 88s. cash, the market quickly fell to 87 1/2 s., receding further to 87 1/4 s., with slight rally to 88 1/4 s.

Feb. 25th. The recent decline produced a somewhat extensive business, 86 3/4 s. down to 86 1/4 s. being done chiefly for sharp payment; closing buyers at 86 1/2 s. sharp cash.

**Tin Plates.**—There is no business worth recording.

We quote per box as follows: Charcoal tins, Melyn grade, 1/2 cross, \$6 1/2 @ \$6 3/4; Allaway grade, \$5.80 @ \$5 1/2. Charcoal Roofing, Dean grade, \$5 1/2 for 14 x 20, and \$11 1/4 for 20 x 28; Allaway grade, \$5 1/2 @ \$5 1/4 for 14 x 20, and \$10 1/4 @ \$10 1/4 for 20 x 28. Coke Roofing, B. V. grade, \$4 1/2 for 14 x 20, and \$9 1/2 for 20 x 28. Coke tins, A. B. grade, IC, \$4.90 @ \$5 B. V. grade, ICW, \$4.40 @ \$4.50 for 14 x 20.

Messrs. Robert Crooks & Co., of Liverpool, under date of February 24th, say of tin andterne plates:

The situation remains unchanged, both buyers and cheap sellers being few. Coke tins, being in heaviest stock, are weakest description, while good steel tins are well supplied with orders for the present, and firm at an average advance of 6d. from lowest point. In terms of all sorts, though quotations are mostly still high, there is so little doing that we quite expect a relapse similar to that in coke tins.

**Pig-Lead.**—This is very quiet, with little doing. We quote 4 85c.

**Spelter and Zinc.**—We quote 5 1/2 c. for the former and the latter at 6 1/2 c.

**Antimony.**—We quote Cookson's at 15c., and Halllett's and Johnson's at 14 1/2 c.

**Quicksilver.**—The San Francisco Commercial Herald, under date of March 3d, says:

The market is very dull and prices entirely nominal, say 39 @ 40c.

The exports for week ending February 24th:

	Flasks.	Value.
Previously since January 1st, 1881	1,600	\$47,823
	4,753	134,785

Total ..... 6,353 \$182,608

Total same period 1880..... 3,916 119,958

Increase in 1881..... 2,437 \$62,640

Receipts since January 1st, 1881, 8017 flasks. Overland shipments from January 1st to February 1st, 1881, 1255 flasks.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 11.

There is from various causes considerable quietness in the iron trade at the present time. The most prominent cause, however, is that too much business was done previously. The quietness, again, is probably much more apparent than real, owing to the fact that many consumers are following a hand-to-mouth policy in their purchases, and from the fact that the aggregate of sales to consumers near the producing points, and which do not come to the notice of the host of brokers and dealers, are considerable, and enable the companies to show considerable strength in the prices for the balance of their product. The outlook continues to be very favorable for producers of all classes of iron and steel.

**American Pig.**—During the past two weeks, there have been some lots of No. 1 and No. 2 Foundry irons of Allentown and Crane makes offered and sold at concessions. These lots were hypothecated with bankers and taken up by a dealer. It is understood that they have all been sold. Outside of this there is, perhaps, a shade of weakness being shown by some of the companies. This, however, is only such as should naturally be

looked for under the quietness and lack of large orders which prevail. No. 1 Bessemer iron is reported to have been offered at Hoboken at \$25 per ton. We quote No. 1 Foundry at \$25@26; No. 2 Foundry, \$22@23; and Forge, \$20@21.

**Scotch Pig.**—This article is quiet and without particular change. A lot of 1500 tons which has arrived since our last is going into store. Prices in Glasgow are still declining, but so far the decline has not exceeded the advance in freights to this country. We quote Eglinton at \$22; Coltness, at \$24½@25; Glengarnock, at \$23@23½; and Gartsherrie, at \$23@23½.

Messrs. John E. Swan & Brothers, of Glasgow, under date of February 25th, 1881, report 120 furnaces in blast, as against 111 at the same time last year. The quantity of iron in Connal & Co.'s stores was 526,111 tons, an increase of 2249 tons for the week. The shipments show a decrease since Christmas of 32,737 tons, as compared with the shipments to the same date in 1880. The imports of Middlesbrough pig-iron for the same period show a decrease of 11,753 tons. The following were the quotations of the leading brands of No. 1 pig iron: Gartsherrie, 59s. 6d.; Coltness, 60s.; Langloan, 59s. 6d.; Summerlee, 60s.; Carnbroe, 57s.; Glengarnock, 57s.; Eglinton, 51s. Middlesbrough pig-iron was quoted as follows, f. o. b.: No. 1 Foundry, 43s.; No. 2, 41s.; No. 3, 39s.; No. 4, 38s. 6d.; No. 4 Forge, 38s. 6d.

Messrs. J. Berger Spence & Co., of Manchester, England, under date of February 26th, say:

The slight tendency toward improvement in the pig-iron trade which we last week reported has been again arrested. The demand for export being so limited seems to be chiefly responsible for this. The "bearing" operations having ceased, all excitement is removed, and buyers have not sufficient confidence in the state of affairs to believe prices can go no lower. This is an additional cause of the backward movement. The little progress made by Glasgow Warrants last week has been entirely lost. The fluctuations have been continually downward, and to-day 50s. has been reached. In Middlesbrough Numbers, business has almost been at a stand-still, and the number of inquiries now current are by no means encouraging. No. 3 is nominally at 38s. 6d. per ton, but sellers are by no means firm at this, and offers at under this figure receive favorable consideration. No. 4 Foundry and No. 4 Forge obtain rather higher rates proportionately, but in point of fact the quantities changing hands are very limited indeed. Bessemer is steady, and some manufacturers have advanced their quotations. The Lancashire iron trade is very unsatisfactory, and stocks are quickly increasing.

**Rails.**—We learn of no important new business; English steel are quoted at about \$63@63½, and American, at mills, at \$63@65 for early delivery. The latter are only nominal, as all the mills have contracted for all they can deliver at an early day, and any further orders will be but wronging those who previously contracted. Iron rails are quiet. The mills are, however, pretty well booked ahead. We quote American at \$48@50 at mills, and English \$46@47 here.

**Old Rails.**—These are very quiet. We quote Ts. at \$27½@28, and D. Hs. at \$29.

**Wrought Scrap.**—Without learning of business, we quote nominally at \$30@31.

We publish the following letters from our regular correspondents:

**Baltimore.** March 7.

[Specially reported by R. C. HOFFMAN & Co.]

The iron market remains unchanged from last report. A fair amount of business is doing, and prices firm at about following rates:

Balt. Char. . . . .	\$38.00@40.00	Mot. and Wh. . . . .	\$18.00@20.00
Va. " . . . .	38.00@40.00	Cl. C. B. Bl'om . . . . .	55.00@60.00
Anth. No. 1. . . . .	25.00@27.00	" " Billets . . . . .	" " " "
" " 2. . . . .	23.00@24.00	Refined Bl'm. . . . .	45.00@50.00
" " 3. . . . .	20.00@22.00		

**Columbus, O.** March 9.

[Specially reported by KING, GILBERT & WARNER.]

The market during the past week has been quiet, as a large number of the furnaces are asking an advance in prices which the consumers are as yet unwilling to pay; sales have been mostly in small lots for immediate use; stocks at furnaces are generally small. We quote as follows:

**FOUNDRY IRONS.**

No. 1 Hanging Rock charcoals. . . . .	\$27.00@27.50
" " 2 . . . . .	26.00@26.50
" " 1 Hocking Valley . . . . .	23.50@24.00
" " 2 . . . . .	22.50@23.00
" " 1 American Scotch . . . . .	23.50@24.00
" " 1 Glasgow . . . . .	23.50@24.00
" " 1 Jackson County . . . . .	22.50@23.00
" " 2 . . . . .	21.50@22.00
" " 1 Silver Gray . . . . .	21.50@22.00
" " 2 . . . . .	20.00@21.00

**MILL IRONS.**

Gray neutral . . . . .	21.00@22.00
Mottled and white neutral . . . . .	19.00@20.00
Gray cold short . . . . .	20.00@21.00
Mottled and white cold short . . . . .	18.00@19.00

**Louisville.** March 8.

[Specially reported by GEORGE H. HULL & Co.]

The market is firm, with a disposition on the part of consumers to contract for future delivery. Several large sales of this character have been made. We quote for cash as below:

**FOUNDRY IRONS.**

	No. 1.	No. 2.
Hanging Rock Charcoal. . . . .	\$27.00@28.00	\$26.00@27.00
Southern Charcoal. . . . .	25.00@26.00	23.00@24.00
H'ng Rock, Stc'l & Coke. . . . .	23.50@24.00	22.50@23.00
Southern Stonecoal & Coke. . . . .	23.50@24.00	22.50@23.50

"Amer. Scotch" \$23.00@24 | Silver Gray \$19.00@22.00  
Scotch Iron. . . . . 27.00@29

**MILL IRONS.**

No. 1 Charcoal, Cold-short & Neutral. . . . .	\$22.00@24.00
No. 1 Stc'l & Coke, Cold-short & Neutral. . . . .	22.00@ . . . . .
No. 2 Stc'l & Coke, Cold-short & Neutral. . . . .	21.00@ 21.50
No. 1 Missouri and Indiana, Red-short. . . . .	26.00@ 27.00
White & Mottled, Cold-short & Neutral. . . . .	19.00@ 20.00

**CAR-WHEEL AND MALLEABLE IRONS.**

Hanging Rock, Cold Blast. . . . .	\$35.00@42.00
Alabama and Georgia, Cold Blast . . . . .	35.00@ 40.00
Kentucky, Cold Blast. . . . .	35.00@ 40.00

**Richmond.** March 8.

[Specially reported by ASA SNYDER.]

Trade continues moderately active, with prices firm. New brands of pig-iron are offered at \$1 to \$2 per ton under ruling figures.

**John H. Austin & Co.'s Special Market Report.**

LONDON, E. C., Feb. 24.

**STEEL RAILS.**—\$6 7s. 6d. @ \$6 17s. 6d. per ton. Market rather easier, notwithstanding a fair inquiry. Makers at outside ports are inclined to accept even 2s. 6d. ton less. Freights continue to advance, thus checking business, as c. i. f. offers appear high in consequence.

**IRON RAILS.**—\$5 7s. 6d. @ \$5 15s. per ton; a fair inquiry for sections from 30@40 lbs. per yard, but the freight difficulties again materially obstruct business.

**BAR IRON.**—\$5 2s. 6d. @ \$5 7s. 6d. per ton, with a fair home demand.

**OLD RAILS.**—Very fair on advices of a decline at U. S. ports. Very few O. D. Hs., however, are offering, but small parcels of Continental Flange are pushed out, and tend further to depress prices.

**HEAVY WROUGHT SCRAP-IRON.**—Quieter; 1200 tons reported c. i. f. to New Orleans, at 86s. @ 88s. per ton.

**OLD RAILWAY LEAF SPRING STEEL.**—Very strong demand; about 400@500 tons sold c. i. f. New York, at \$5 15s. up to \$6 per ton, March to May shipments.

**OLD CAST-IRON RAILWAY CHAIRS.**—Very quiet, at 43@45s. per ton.

**STEEL BLOOMS, 7" x 7" AND UPWARD.**—Large inquiry, but little business doing; prices asked \$5 15s. @ \$6 per ton net.

**BESSEMER PIG-IRON, Nos. 1, 2, and 3.**—Flat at 62s. 6d. @ 67s. 6d. per ton.

**STEEL RAIL CROPS.**—77s. 6d. per ton.

**SCOTCH PIG-IRON.**—Flat, chiefly owing to the great accumulation of stocks. Cash price to-day 50s. per ton, f. o. b.

**MIDDLESBROUGH PIG-IRON, No. 3.**—Follows Scotch, 38s. 6d. cash.

**COAL TRADE REVIEW.**

**Anthracite.**

NEW YORK, Friday Evening, March 11.

There is quite a falling off in new orders for anthracite coal, and many old orders have been canceled. This condition of affairs may appear strange to many, but to us it is evident that it is due to a lack of confidence on the part of the public as to the future policy of the companies. In past years, it has been the policy to make a reduction in prices in the spring, to induce consumers and dealers to make purchases, and the same action is expected on the part of buyers this year. The managers of the coal trade assert that they will make no reduction this year, and argue that the public will take as much coal at present prices as they would at lower ones, and that they are prepared to make such restrictions as will make it an easy matter to maintain prices. A curtailment of one half time will probably be inaugurated next week, and continue through this month at least. The only obstacle at the present time appears to be the absence of Mr. Sloan, of the Delaware, Lackawanna & Western R.R. He is expected to be in his office to-morrow morning, after which the matter will probably be settled. There is evidently a very good feeling among the officers of the several companies, and all are anxious to work in harmony and give their stockholders some profits this year. We have no doubt that the "combination" will be successfully continued through this year from the fact that it is a year in which but little if any artificial influence is necessary to aid in its maintenance. Such being the case, we consider that it would be a great advantage to both the companies and the consumers that the policy of the former should be very decided now. If restriction is to be the means of maintaining prices, over-restric-

tion will be better for all interests until an understanding is a certainty.

There is an under-cutting in prices, which, we believe, is not confined entirely to Trinity Building, but has been participated in by one or two of the large companies at least.

There is nothing in the situation to indicate that the country is going to take less coal than we thought earlier in the year, nor that it is going to pay less for it.

Our Philadelphia correspondent writes as follows under date of March 10th:

The same condition of things exists as reported last week, only more marked.

Buyers are waiting for the spring programme before ordering more coal.

Vessels are by no means plenty, but orders being scarcer than the vessels, freights are weak and promptly settling to reasonable rates. From \$1.60 to \$1.75, according to size, is the present rate to Boston.

**Southern Central Railroad.**

GENERAL FREIGHT DEPARTMENT, (AUBURN, N. Y., March 3, 1881.)

**TO COAL SHIPPERS:** During the past winter this company has largely increased its facilities at Fair Haven, on Lake Ontario, for the storing and forwarding of coal. The stocking ground has been very much extended, and new trestles are constructing, while the pocket capacity has been doubled. The pockets are all provided with screens, thus insuring the loading of vessels with coal in the best condition for market.

The charge for handling coal at these docks during the ensuing season has been fixed at 25 cents per ton of 2000 pounds. This charge will include all clerical service for keeping the receiving and forwarding accounts of shippers; the chartering of vessels; loading coal either from stock or cars; the rendering of such statements as may be required by shippers; and the free towage of vessels into and out of the harbor, provided it can be done by the company's tug. If free towing is given, shippers will be required to furnish the tug with coal when engaged in their service.

With the assurance that we shall endeavor to merit your increased favors by an earnest effort to forward your interests as shippers, I remain,

Very respectfully yours, etc., CHARLES A. WARDEN, General Freight Agent, etc.

**Bituminous.**

There are a number of contracts under negotiation or completed. The indications rather favor a fight between the Baltimore & Ohio and the Pennsylvania R.Rs. The former road has reduced its rates 25c. per ton of 2000 lbs. The rate from Cumberland to Locust Point is now \$1.62, and from Piedmont, \$1.83. It is said that the boatmen on the Chesapeake & Ohio Canal are asking an advance of 25 to 30c. per ton over the rates paid last year.

We publish the following letters from our regular correspondents:

**New Orleans.** March 3.

[Specially reported by C. A. MILTENBERGER & Co.]

The stock of coal on hand in this market continues small, notwithstanding some arrivals from above during the month of February. The stock is likely to remain small for some months, in consequence of the breaking of the dams at Pittsburg, causing a serious interruption to the loading of coal at many of the mines there. Owing to these same disasters, great excitement prevailed in this market during February, and wholesale rates advanced to 65c., while retail prices were fixed at \$1 per bbl. The excitement abated on receipt of the news, shortly after, of the flood at Pittsburg, which enabled the runners of coal to get what craft were loaded through the breach, and prices have since declined to 50c. wholesale (firm), and retail figures to what they were on February 1st. Demand is good, with prospects for active trade this spring and summer, with the sugar planters and other large consumers.

Coal on hand in this city March 1st: Pittsburg coal, 31 boats. Consumption during February: Pittsburg coal, 27 boats and 4 barges. Arrivals during February: Pittsburg coal, 24 boats from Pittsburg, 4 boats from Vicksburg, and 5 boats from Red River Landing.

**Richmond.** March 3.

[Specially reported by Mr. S. H. HAWES.]

No change in quotations for shipments from this port. Our market is quite bare of anthracite and Cumberland coal. Nothing special to note at present.

**San Francisco.** March 3.

As we have long predicted, the price of Coos Bay and other bituminous has declined materially from combination prices, and may now be quoted fully \$2.50 per ton below the highest rates of the season. A correspondent has this to say of the great coal-fields of the North: The coal mines of Puget Sound are the most extensive and valuable of those of any State in the Union, and it is only recently that a large traffic in that commodity has been created. All the various rivers running into Puget Sound pass over immense coal-fields of most excellent quality, bituminous and anthracite. The largest of these fields is on the Skagit River, which is navigable for 100 miles from its mouth, and only partially explored on either of its shores. The next two largest coal-fields are on the Stillaguamish and Black rivers. These mines are only imperfectly worked, yet they afford a large revenue to their owners, who have a line of ships to freight the product of their three mines to San Francisco at all seasons of the year, besides what is sold to foreign vessels of other nations. Here, then, is a vast wealth for which Washington territory never got credit; yet it is of greater value and duration than that of Pennsylvania and Ohio combined. Imports during the week include the following: Per Enoch Talbot, 1800 tons Seattle; Clara Light, 252 tons Coos Bay. The British bark Dalhanna, from Glasgow, has 1300 tons Scotch, and the St. John, from Baltimore, has 2508 tons of Cumberland to a dealer. We understand that the San Francisco Gas Company has

contracted for its year's supply of Australian at or about last year's rates. The Dr. Metzger, from Cardiff, has 954 tons; Deemah, from Newcastle, N. S. W., 1320 tons; Madura, from Greenock, 1372 tons; Perthshire, from Newcastle, N. S. W., 910 tons; H. S. Gregory, from New York, 450 tons; Samuel Watts, from same, 422 tons; George Stetson, from Philadelphia, 745 tons; City of Philadelphia, from same, 98 tons; Kinross, from Liverpool, 1284 tons; Ocean King, from Newcastle, Eng., 2074 tons; Wallace-town, from same, 988 tons.—Commercial Herald.

**FREIGHTS.**

**Coastwise Freights.**

Per ton of 2240 lbs.

Representing the latest actual charters to March 11th, 1881.

Ports.	From Philadelphia.		From Elizabethport, Port Johnston, South Amboy, Hoboken, and Weehawken.
	From Philadelphia.	From Baltimore.	
Alexandria.....	1.15	1.00	
Annapolis.....	.75		
Apportion.....			
Baltimore.....	.60		
Bangor.....			
Bath, Me.....		2.00	
Beverly.....			
Boston, Mass.....	2.00@1.75	2.15	1.50@1.75
Bristol.....			
Bridgeport, Conn.....		1.85	
Brooklyn.....			
Cambridge, Mass.....			
Cambridgeport.....			
Charleston.....	1.75		
Charlestown.....			
Chelsea.....			
City Point.....			
Com. Pt., Mass.....			
E. Boston.....			
East Cambridge.....			
E. Gr'nwich, R. I.....			
Fall River.....		1.85	
Fredericks'g, Va.....			
Galveston.....			
Georgetown, D. C.....			
Gloucester.....			
Hartford.....			
Hackensack.....			
Lambertville.....			
Lynn.....	2.00@2.25		
Marblehead.....			
Medford.....			
Millville.....			
Milton.....			
N. Brunswick, N. J.....			
New Bedford.....		1.85	
Newburyport.....		2.50	
New Haven.....		1.80	0.75
New London.....		1.75	
Newbern.....			
Newport.....			
New York.....		1.75	
Norfolk, Va.....		.80	
Norwich.....		1.85	
Norwalk, Conn.....			
Petersburg.....			
Philadelphia.....	.65		
Portland.....	2.25		
Portsmouth, Va.....			
Portsmouth, N. H.....	2.25		
Providence.....	1.75	1.25	
Quincy Point.....			
Richmond, Va.....	1.00		
Rockland.....			
Rockport.....			
Roxbury.....			
Saco.....			
Sag Harbor.....			
Salem, Mass.....		2.25	
Saugus.....			
Savannah.....	1.80		
Somerset.....	1.75		
Staten Island.....			
Trenton.....			
Troy.....			
Wareham.....		1.85	
Washington.....	1.25@1.20	1.00	
Weymouth.....			
Williams'g, N. Y.....		.60	
Wilmington, Del.....			
Wilmington, N. C.....	1.50		

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

**STATISTICS OF COAL PRODUCTION.**

The Production of Bituminous Coal for the week ending Feb. 26th was as follows:

Tons of 2000 lbs., unless otherwise designated.		
	Week.	Year.
	Tons.	Tons.
Cumberland Region, Md.	28,170	237,717
Barclay RR., Pa.	4,814	81,713
Broad Top Region, Pa.	4,805	41,958
Huntingdon & Broad Top RR.	1,797	10,040
Clearfield Region, Pa.	1,513	8,243
Tyrone and Clearfield.	38,733	275,702
Alleghany Region, Pa.	5,886	42,551
Pennsylvania RR.	7,244	56,995
Pittsburg Region Pa.	708	7,746
West Penn RR.	17,808	143,017
Southwest Penn. RR.	14,556	101,437
Penn & Westmoreland gas-coal, Pa. RR.		
Pennsylvania RR.		

**The Production of Coke for the week ending Feb. 26th, and year from Jan. 1st.**

Tons of 2000 lbs.		
	Week.	Year.
	Tons.	Tons.
Penn. RR. (Alleghany Region).....	2,118	15,902
West Penn. RR.....	1,671	14,318
Southwest Penn. RR.....	33,055	238,878
Penn. & Westmoreland Region, Pa. RR.....	3,704	27,431
Pittsburg, Penn. RR.....	7,774	62,909
Snow Shoe (Clearfield Region).....	134	1,394
<b>Total</b> .....	<b>48,456</b>	<b>360,832</b>

\* For the week ending March 5th. Comparative statement of the production of anthracite coal for the week ending March 5th, and years from January 1st:

Tons of 2240 lbs.	1881.		1880.	
	Week.	Year.	Week.	Year.
<b>Wyoming Region.</b>				
D. & H. Canal Co.	82,835	594,256	47,880	565,294
D. L. & W. RR. Co.	85,376	686,811	55,981	567,317
Penn. Coal Co.	23,140	177,786	18,782	108,644
L. V. RR. Co.	21,172	175,804	3,285	173,682
P. & N. Y. RR. Co.	1,430	7,218	312	1,944
C. R. R. of N. J.	*	338,950	38,396	230,731
<b>Total</b>	<b>213,953</b>	<b>1,980,825</b>	<b>164,636</b>	<b>1,647,612</b>
<b>Lehigh Region.</b>				
L. V. RR. Co.	79,613	686,015	47,896	430,154
C. R. R. of N. J.	*	277,847	30,946	297,841
S. H. & W. B. RR.		676		6,841
<b>Total</b>	<b>79,613</b>	<b>964,538</b>	<b>78,842</b>	<b>734,836</b>
<b>Schuylkill Region.</b>				
P. & R. RR. Co.	108,628	914,122	88,054	794,778
Shamokin & Lykens Val.	17,386	171,019	12,633	88,649
<b>Total</b>	<b>126,014</b>	<b>1,085,141</b>	<b>100,687</b>	<b>883,427</b>
<b>Sullivan Region.</b>				
St. Line & Sul. RR. Co.	936	10,396	607	7,618
<b>Total</b>	<b>420,516</b>	<b>4,040,900</b>	<b>344,772</b>	<b>3,273,493</b>
Increase.....		767,407		
Decrease.....				

\* This report was 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.

Total same time in 1876.....	1,501,563 tons.
" " " " 1877.....	2,598,296 "
" " " " 1878.....	2,308,969 "
" " " " 1879.....	3,395,082 "
" " " " 1880.....	3,273,493 "

**Belvidere-Delaware Railroad Report for the week ending March 5th:**

	Week.	Year.	Year.
		1881.	1880.
Coal for shipment at Coal Port (Trenton)			
Coal for shipment at South Amboy	12,620	68,828	73,861
Coal for distribution	16,243	152,220	77,616
Coal for company's use	1,676	19,720	18,407

The decrease in shipments of Cumberland Coal over the Cumberland Branch and Cumberland & Pennsylvania Railroad amounts to 80,161 tons, as compared with the corresponding period in 1880.

**COAL AND IRON NOTES.**

The Thirty-fourth Annual Report of the Pennsylvania Railroad Company.—The annual report of the Board of Directors of the Pennsylvania Railroad Company for 1880, submitted to the shareholders at their meeting March 1st, is an extremely favorable one, and will prove eminently satisfactory to the stockholders of the company. The total earnings of the main line and branches, Philadelphia to Pittsburg, during 1880, were \$25,987,657; the expenses for operating the same were \$14,051,485, leaving \$11,936,172 as net earnings from operating the main line and branches; to this should be added \$3,805,751 interest on investments, rentals, coal royalties, and Empire line earnings, making a total of \$15,741,923. Rentals paid on branch roads, interest on bonded debt, State taxes, interest on purchase of the main line, and interest on car trusts amount to \$5,690,437; leaving as the net income of the Pennsylvania Division, \$10,051,486. The showing of the New Jersey Division, consisting of the United New Jersey Railroad and Canal Company, including the Belvidere-Delaware Railroad and Flemington Branch, is not so favorable. This, the managers state, is "due to the continued expenditures required to replace in a more efficient shape the temporary structures and old equipment formerly upon that line." The earnings of this division amount to \$11,544,081, less \$8,215,208 expenses, leaving \$3,328,873 as net earnings, to which should be added \$192,384 interest received in cash from investments, making the total net earnings \$3,521,257. Against this there are placed payments on account of dividends, interest, etc., and on account of interest on equipment used by the Belvidere-Delaware Railroad Company, amounting in all to \$4,557,166, leaving a net loss in operating United Railroads and Canal Company's property of \$1,035,909.

The net income of the Pennsylvania Division, \$10,051,486, less the net loss of the New Jersey Division, \$1,035,909, shows a balance of \$9,016,177. From this balance there have been deducted payments of bonds, etc., for which the Pennsylvania Railroad Company was responsible, amounting in all to \$1,377,607, leaving balance to the credit of net income account of \$7,638,570, out of which dividends of seven per cent were paid, and the balance, \$2,817,656, transferred to the credit of profit and loss for 1880. Adding to this the amount to credit of profit and loss December 31st, 1879, \$4,181,073, it will be seen that the amount to the credit of profit and loss December 31st, 1880, was \$7,793,949.

Regarding the various anthracite coal companies in which the railroad company is interested, the report presents the following statements:

SUSQUEHANNA COAL COMPANY.	
Receipts from sale of coal, etc.	\$2,341,844.13
Expenses mining, selling, and shipping coal, including taxes and amount charges off for exhaustion of lands, being 10 cents a ton on coal mined above certain sizes, and decrease in value of stock coal	1,961,015.84
<b>Net earnings for 1880</b>	<b>\$360,828.29</b>

Brought forward.....	\$360,828.29
From which deduct:	
Interest on funded debt.....	\$120,000.00
Interest of purchase-money mortgage.....	17,150.54
Interest and discount.....	10,246.50
<b>Balance</b> .....	<b>\$213,431.25</b>

Less decrease in appraisement of personal property in and around the mines (as per inventories), as compared with January 1st, 1880..... 3,624.75

<b>Net profit, 1880</b> .....	<b>\$209,806.50</b>
<b>Net profit, 1879</b> .....	<b>10,022.06</b>
<b>Being a comparative increase of</b> .....	<b>\$199,184.44</b>

SUMMIT BRANCH RAILROAD COMPANY.	
Receipts from sale of coal, rents, etc.	\$968,117.05
Receipts from freight and passenger traffic and mails	60,352.30
<b>Total</b>	<b>\$1,028,469.35</b>

Expenses mining, selling, and shipping coal, including taxes and amount charged off for exhaustion of lands..... \$895,558.58

Expenses operating railroad, including rental paid Lykens Valley Railroad Company..... 61,138.82

Net earnings for year..... \$71,771.95

Add amount received from Lykens Valley Coal Company on account of advances made in that company in 1879, and charged off in that year..... 48,907.80

From which deduct:

Interest on funded debt.....	\$70,000.00
Interest and discount.....	15,869.81
<b>Total</b>	<b>\$85,869.81</b>

Net profit of 1880..... \$34,809.94

Net loss for 1879..... 47,006.57

Being a comparative increase in profits in 1880 of..... \$81,861.51

On the first of July, 1880, the operation of the Lykens Valley Railroad, which had been heretofore under the charge of the Summit Branch Railroad Company, was transferred to the Northern Central Railroad Company, under the belief that it could be managed more economically in connection with that system of roads than as a short detached line.

LYKENS VALLEY COAL COMPANY.	
Receipts from sale of coal, rents, etc.	\$701,175.29
Expenses mining, selling, and shipping coal	652,267.50
<b>Total</b>	<b>\$48,907.80</b>
<b>Net loss for 1879</b>	<b>46,319.62</b>

Being a comparative gain in 1880 of..... \$95,227.42

MINERAL RAILROAD AND MINING COMPANY.	
Receipts from sale of coal, rents, etc.	\$1,269,762.67
Expenses mining, selling, and shipping coal	1,004,948.50
<b>Total</b>	<b>\$264,814.06</b>

Showing a comparative gain over 1879 of \$214,674.90

From which deduct:

Royalty paid on coal	224,955.51
<b>Total</b>	<b>\$39,858.57</b>
<b>Net profit for 1879</b>	<b>1,000.12</b>

Being an increase in profits in 1880 of..... \$38,768.45

The average price per ton at point of sale, aggregating the results of the four coal companies for 1880 was \$3.34 @ 10, as against \$2.67 @ 10 for 1879, showing an increase of 66 @ 10 cents per ton.

It will be seen from the foregoing statements that the coal companies show much more favorable results than for the preceding year, having been able, after paying the interest upon all their fixed liabilities (including an additional royalty paid by the Mineral Railroad and Mining Company of 41 cents per ton, amounting to \$160,104.06), to show a surplus profit of \$284,475.01. The various companies have also pursued, during the past year, the conservative plan noted in former reports, of reducing the values of their properties in general account, by a charge for depreciation, in proportion to the output of coal during the year.

During the latter part of the year, the policy of continuously working the mines has been pursued in preference to that of periodical suspensions, believing that the coal could, by this system, be more cheaply produced and transported, the output being governed by the general demand of the market.

While the total amount of anthracite coal mined by the various companies in Pennsylvania, in 1880, was 23,437,242 tons, as against a production, in 1879, of 26,142,689 tons.

Showing a decrease of 2,705,447 tons. The output of your companies for 1880 was 1,500,205 tons, being an increase over 1879 of 213,453 tons.

The coal shipments over the main line and branches increased 729,857 tons, and the coke shipments 384,871 tons, the aggregate tonnage being 7,494,723 tons, as against 6,379,995 in 1879, a gain of 1,114,728 tons. The East-bound coke movement shows a further increase of 84,647 tons over the preceding year, and the West-bound a gain of 300,224 tons, the aggregate of all shipments being 1,612,881 tons, as compared with 1,228,010 in 1879.

A careful examination of all the properties was made during the year by Mr. Joseph S. Harris. His report, under date of October 1st, 1880, is replete with valuable information. He estimates the amount of coal to be taken from the lands of the Susquehanna Coal Company at 63,000,000 of tons, that from the Mineral Railroad and Mining Company's lands at 20,000,000, and that from the Lykens Valley lands at 20,000,000, making an aggregate of workable coal of 103,000,000 tons.

There were used upon the main line and branches 11,425 tons of steel and 719,051 ties; on the Philadelphia & Erie road, 2379 tons of steel and 183,545 ties; and on the United Railroads of New Jersey Division, 3417 tons of steel and 262,341 ties, making a total of 17,221 tons of steel and 1,164,937 ties.