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[WITH TWO SUPPLEMENTS.]

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Business communications for the Western Department should be addressed to the West-

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#### THE METER AND THE METRIC SYSTEM.

The letter of Gen. Vinton, published in another column, is vigorous and interesting, and it may prove salutary to such as believe that the meter has an exact relation to natural and permanent dimensions. But we are not among that number, and we know of none among the intelligent advocates of the metric system who are ignorant that its unit is derived from erroneous measurements and calculations. What we want is the system, with its comprehensive harmony and commensurability of units of length, volume, and weight. We accept it, meter and all, because so large a part of the civilized world has already adopted it. Arguments about the origin of the meter and comparisons between it and hypothetical units are about as pertinent as those ingenious demonstrations by which the decimal notation is shown to be inferior to some other notation of which eight or twelve, instead of ten, should be the basis. Nobody can answer the arguments; but nobody cares for that.

On the other hand, the derivation of a unit of measurement directly from nature is neither so easy nor so important as Gen. Vinton seems to think. It is not important, because the practical standard always will be a metal bar; and the operation of comparing this bar with any natural magnitude, or of restoring it when lost, by new calculations and measurements, is one which will require to be performed very seldom. That being the case, it is of no consequence whether the unit bears a simple or a complex relation to any natural magnitude. It is quite immaterial whether the acceleration of gravity per second at Paris is ten times or eighteen times or any other number of times the unit. The unit once given, the relation can be determined with whatever degree of accuracy the nature of the case permits; and then, the unit being lost or needing correction, its proper length can be again determined by a reverse process. equally feasible for the meter, the yard, or any one of the innumerable feet and inches which infest the world.

But, on the other hand, the obtaining from nature of a unit which "will be there every time," as Gen. Vinton says, is not so easy, as he seems to think. The acceleration due to gravity at any given point is not necessarily constant, though it is assumed to be so; nor is the sidereal day absolutely invariable, so far as we can judge. It is now longer by one part in 2,700,000 than it was 720 B. C. The progressive cooling of the earth and the dissipation of energy by tidal waves may be among the causes of this change. But the acceleration of gravity depends on the changing shape of the earth, and this element has never been meas ured. It may be admitted that these causes of variability are trifling; but that does not answer the criticism. Moreover, the practical difficulty of measuring the acceleration of gravity is very great. Probably Gen. VINTON would recommend the use of the pendulum. But no one who has attempted to determine the length of a pendulum will admit that it is easy; for the length required is the distance from the center of suspension to the center of oscillation. Now, there are no direct means of determining the latter point. Prof. W. STANLEY JEVONS (in The Principles of Science, p. 315) discusses this point, and refers also to the numerous questions concerning resistance, friction, etc., which require empirical or hypothetical equations of correction. In Grant's History of Phy sical Astronomy, we believe, it is shown that all the experiments made for the British government to determine the ratio between the standard yard and the seconds pendulum were vitiated by errors in these corrections. Prof. Jevons concludes his chapter on the subject by saying, "Thus it is found that the pendulum standard cannot compete in accuracy and certainty with the simple bar standard; and the method would only be useful as an accessory mode of restoring the bar standard if at any time again destroyed."

Prof. CLERK MAXWELL has suggested that "in the present state of science the most universal standard of length which we could assume would be the wave

length in vacuum of a particular kind of light emitted by some widely diffused substance, such as sodium, which has well-defined lines in its spectrum." This is approved by Prof. Jevons, who says that there can be no reasonable doubt that vibrations of light are, as far as we can tell, the most fixed in magnitude of all phenomena. But the whole matter is, declared to be one which por theoretical interest, but no present practical importance.

When Gen. Vinton, therefore, proposes the acceleration of gravity as furnishing the best, most accurate, most available standard of measurement, we reply that we can refer the meter to that standard as easily as he can the foot or yard; but that the accuracy of it is not absolute, since nobody can absolutely measure the acceleration of gravity, or even directly measure the length of the pendulum, and hence we do not agree with Gen. VINTON that this natural standard "can be measured more accurately than any line on the earth's surface." And whether this be so or not we do not see that it at all concerns the practical convenience and importance of the metric system.

#### WATER GAS.

A very interesting paper upon the Lowe process, from the pen of Mr. ROBERT Briggs, of Philadelphia, appeared, much to our surprise, in the conservative columns of our contemporary the Gaslight Journal of the 17th inst. This paper was suggested by Prof. McBTON's Harrisburg report, of which Mr. BBIGGS says: "Prof. Morton's analysis may be accepted fully, as exhibiting the most favorable production of this gas as a process." This statement is doubtless subject to qualification, because, among other reasons, the gas analyzed was unpurified, as our readers have already been informed by a correspondent in these columns, and because the accuracy of the analysis is still questioned. The article is an extended one, and shows so much familiarity with both the physics and chemistry of the subject, that we gladly reproduce as much of it as our space will permit.

The interest which the readers of this JOURNAL have in the question of water gas is not at all a controversial one, nor is it confined or even principally in the manufacture of illuminating gas. The experiments already made seem to have demonstrated the very important fact that both heating and illuminating gas can be economically manufactured by this process from peat, lignite, anthracite culm, and probably from any kind of coal. Mr. BRIGGS's paper treats of the illuminating gas only, though the points made are of general interest. He says:

"The claim of the 'Lowe process' is that 50 pounds of anthracite and three gallons of petroleum (benzine) will make 1,000 cubic feet of illuminating gas of somewhat above standard quality on an average production. It is understood that about 4,000 cubic feet is the result of each effort or 'run' of the process. Reducing Prof. Morton's figures, there appears to be requisite for the production of 4,000 feet of the gas:

65'1 pounds of water in the form of steam.

105 1 pounds of water in the form of steam.
 38'8 pounds of carbon in the form of anthracite coal devoid of ash.
 79'4 pounds of hydrocarbon in the form of petroleum\* products of destructive distillation of benzine or petroleum.
 2.7 pounds of atmospheric air.

27 pounds of atmospheric air.

186 o pounds of gas of 0.62 density=0.0465 lb. per cubic foot at 70°=4,000 cubic feet in all. (In fact this gas must havehad 1 to 1.25 per cent. in volume of aqueous vapor, but it may be supposed that Prof. Morron neglected this in his analysis, and refers to dry gas.)

"If such gas, as Prof. Morton describes, can be made as a general thing from the materials claimed by the Lowe people, without inordinate wear upon the apparatus, the success of this new water gas project is but a question of time.

"In the absence of any specific gravity figures for the Harrisburg gas, the density of the vapors or gases designated as olefines can be taken to agree with that of olefiant gas (=0.081) when a careful computation of the data, which is otherwise ample for the exactness of this statement, gives a specific gravity of 0.62; that of ordinary coal gas, of 14 to 15 candle power, being 0.43. The same computation which gives the dens.ty finds nearly the same quantity of carbon present as in the same veright of ordinary coal gas; but as the volumes of these gases vary inversely with their specific gravities, that is, as 0.43 to 0.02, it follows that a cubic foot of Harrisburg gas contains 44 per cent. more carbon than a cubic foot of ordinary coal gas. Here again the data fails; no report of the illuminating value of Harrisburg gas accompanies the analysis. If this is on an equality in illuminating power with coal gas, then 44 per cent., and not 70 per cent., as given by Prof. Morton, more of carbonic acid gas will be evolved in giving equal light in equal time.

"The remainder of Prof. Morton's paper referring to the character of this case."

given by Prof. Morton, more of carbonic acid gas will be evolved in giving equal light in equal time.

"The remainder of Prof. Morton's paper, referring to the character of this gas, in regard to its suitability for public use for illuminating gas, is open to grave question as to the facts and deductions, and seems to demand an answer to prevent a popular spread of such views. The issue was made, considered, and determined years ago, not only with 'water gas,' but with other coal gas of any kind. Undoubtedly, 'the presence of even a few per cent. of (any illumining gas as well as of) this gas in the air of a room renders it utterly unit for breathing, and often even fatal.' But carbonic oxide gas is not 'one of the most virulent and dangerous of gas poisons,' and no serious difficulty does arise from the presence of carbonic acid gas, whether resulting from the burning of carbonic oxide, or of carbon in other conditions of gaseous combination, in vitiating the air of rooms as usually constructed and occupied, where illumination, in the ordinary sense, proceeds from such burning.

susally constructed and occupied, where illumination, in the ordinary sense, proceeds from such burning.

"As a gas, carbonic oxide, pure and simple, is but in the least degree more dangerous than ordinary coal gas. The Professor can try for himself on the lower animals, and I am convinced he will find poor 'pussy 'quite as quickly affected, and quite as difficult to resuscitate, and quite as little poisoned with the second as with the first; and that the percentage of gases present in the air necessary to produce asphyxiation in nearly equal times will not materially vary. From personal inquiry which I made a few years since at a gas works, where a water gas process continued in use for a long time, I obtained such information as to induce me to believe that no poisoning whatever followed the inhalation of carbonic oxide. It did seem to be more active in causing insensibility, in knocking a man over, as a workman said, but no real disaster, or even serious case of suffocation, ever happened. Headaches, of the same intensity of discomfort as those which follow the accidental breathing of coal gas, were the worst resulting effect. Certainly any one who will breathe an atmosphere largely composed of coal gas will be suffocated, unless promptly removed from the locality. . . . The chance of any person surviving who goes to sleep with an extinguished open gas burner

<sup>\*</sup> In this estimate of petroleum I take the proportion of marsh gas to olefines as that given by Prof. Morton, considering the density of the olefines to be equal to that of olefiant gas—an approximate result, of course, follows.

in his closed room, and remains unawakened until morning, is not very great. What, however, I wish to show distinctly is that there is little choice as to whether the gas of suffocation, in such case, shall be thirty per cent. of carbonic oxide, or have the same thirty per cent. substituted by marsh gas.

"As to the final economical or practical result of this process I express no opinion; it remains to those who are interested in it to develop it if they can; but it is clearly proper that it should have a fair chance on its merits, and that it should not be condemned upon the hypothesis that it is sepecially dangerous above ordinary coal gas, or that it is too dangerous to use.

"There is, however, one other question of great public interest, in connection with this and other novel gas processes, which are being offered to form the bases of rival gas companies in our cities. Is it really good policy for our legislators to grant, or for our capitalists to encourage, or a sound political economy for our writers to advocate, the wholesale destruction of property which is involved in the formation of a new gas company, to occupy the best portion of a city already provided with means for supplying any demand for gas lighting?

"That man may be a great benefactor to his species 'who makes two blades of grass grow where one grew before;' but it may remain a mooted point whether the inventor, who has succeeded in getting two capitals and two supplies for one demand, has really achieved what is conducive to the public good.

Philadelphia, December 5, 1877."

PHILADELPHIA, December 5, 1877."

It is to be regretted that an article so perspicuous in chemistry and physics should drift into such a fog in the political economy of the subject. We suspect that Mr. Briggs has been influenced by the argument of his distinguished countryman, John Stuart Mill, against the multiplication of gas, water, and railway companies, and as that argument is just now being largely quoted by the same conservative interest that has so fondly relied on the carbonic oxide "bugaboo" to ward off competition, it deserves brief analysis.

The gist of Mr. Mill's reasoning is that, "were there only one establishment it could make lower charges consistently with obtaining the rate of profit now realized." Doubtless it could, but would it? Is not competition an indispensable factor in the adjustment of supply and demand, especially of the prime necessaries of life, among which in our present civilization may be reckoned artificial light? Mr. MILLS says:

"When, therefore, a business of real public importance can only be carried on advantageously upon so large a scale as to render the liberty of competition almost illusory, it is an unthrifty dispensation of the public resources, that several costly sets of arrangements should be kept up for the purpose of rendering to the community this one service. It is much better to treat it at once as a public function, and if it be not such as the government itself could beneficially un dertake, it should be made over entire to the company or association which will perform it on the best terms for the public."

The force of this argument, as applicable to gas companies, depends on the assumption that, so far as process is concerned, they all stand on the same planin the cost of production and distribution, and its weakness consists in its leaving out of calculation any advance in the arts of manufacture. Suppose, for example, that the electric system should be found to supply, as is not improb able, a vastly better and cheaper illumination than that of our present gaslight. should the "company or association" to whom the business of gas-lighting had been previously "made over entire" prevent its introduction? And, as Mr. MILL goes a step further in applying the principle to parallel railways, should we not remonstrate with the Elevated Railway Company of New York for depreciating the stock of the horse car roads?

Mr. Briggs admits he is "a benefactor to his species who makes two blades of grass grow where one grew before;" but how, we inquire, is this feat ac complished? Is it not by the application of labor and the expenditure of fer tilizing agents, both of which are capital, and it so be that in his effort to bring in clover he crowds out wire grass, is he not so far guilty of a "destruction of property?" It seems to be established that the Lowe process can furnish a superior light to the consumer at a considerable reduction from the old prices-and the frantic opposition of the old companies seems to show that they are aware of the fact. This, we believe, has been the result in various places where the system is operating. We presume its owners would, on general business principles, be quite as ready that established companies should make the gas as to undertake the introduction of a new plant everywhere themselves. But if the old companies will not adapt themselves to the necessities of the times, then we predict that intelligent communities will follow Mr. MILL's suggestion to its true application, and give their patronage "over entire to the company which will" accept it "on the best terms for the public."

Mr. Mill's argument adopted by Mr. Briggs, while quite correct in theory for a millennial state, where the lion will lie down with the lamb and every man will have a scrupulous regard for the rights of his fellows, is not adopted to the present condition of human morals, and the only possibility of securing progress and economy in manufacture or safety for the public lies in wholesome compe tition among those who serve it, and this is as true in gas manufacture as in any other branch of industry.

### THE LEACHING PROCESS IN NEVADA AND COLORADO. Staff Correspondence of the Engineering and Mining Journal.

It is stated that the lixiviation works recently erected at Ione and Ward districts, Nevada, have not proved successful.

Lixiviation, at present, is a term applied, rather erroneously, to all metallurgical processes where the metals are dissolved out of the mass of crushed ore by either water or some other chemical solvent. There are many modifications of the system, depending, first, on the nature of the solvent-water, brine, chlorinated brine, protochloride of iron, chloride of copper, and other chlorides--and second, upon the nature of the precipitant which draws out the precious metals from their solution. The process, in principle, is several hundred years old. What are known as Ziervogle's and Augustin's processes are perhaps the most

original of the class. Others are the Hunt & Douglass, and the Stewart; the Brunton chloride leaching, and the hyposulphite process. It will be seen, therefore, that lixiviation, or leaching, as a metallurgical process, is as susceptible of modification as smelting; and, if chloride leaching was employed disastrously at Ione, Nev., and successfully at Caribon, Colo., the probability is that the Ione ores were not so well suited for that process as those at Caribou--always supposing that the skill employed in both cases was equal.

Again, leaching, or lixiviation, is a correct process only on certain classes of mineral. Though it has been puffed and praised by ignorant writers beyond all reason, yet it will not succeed everywhere; exactly as amalgamation fails in certain cases.

The Caribou ores (where lixiviation has undoubtedly succeeded) are highly quartz ore, and contain but little base metal. When, therefore, they are placed, after being properly wasted, in a dissolving reagent, the solvent is not overloaded, and the process advances economically. On the other hand, the ores of Ione and Ward districts carry quite large quantities of both lead and copperthe latter not, perhaps, enough to warrant smelting works, but enough to prevent the successful operation of a leaching establishment, if not preceded by dressing machinery to separate the heavier minerals. There appears to be, therefore, no cause of alarm on this subject. Probably, the judicious expenliture of a little chemical and metallurgical skill will determine the cause of the failure and suggest the remedy.

#### NEW PUBLICATIONS.

Annual Report of the Comptroller of the Currency to the Second Session of the Forty-fifth Congress of the United States, D cember 3. SION OF THE FORTY 1877. Washington.

In the peculiar financial experiences through which the country has been bassing since the war, the annual reports of the Comptroller of the Currency lave been among the most important of the documents laid before Congress. Ir. John Jay Knox, the present Comptroiler, has won a hearty appreciation mong experts at home and abroad, by the clear, forcible, and comprehenive character of his reports. The one before us, while it contains less material of general popular interest than was afforded by the history of banking in the eport of last year, is, nevertheless, timely and instructive beyond its special tatistical value. The three most important points are, the proof that specie gold) resumption is feasible; the argument against the excessive taxation of national banks; and the recommendation that the 4 per cent. consols of the United States be permitted to be used by the banks as a portion of their reserves. Coupled with this, Mr. Knox recommends the issue of small 4 per ent. bonds (under fifty dollars), as an investment for the savings of the peoole, which bond; being available to the banks for their legal reserve, would be dways negotiable. That some relief should be afforded to the banks is plain mough from the elaborate statements of this report, and from the simple fact that they are voluntarily surrendering their circulation, which has decreased rom \$348,516,478 (its maximum) in January, 1874, to \$315,881,990 in November, 1877. In speaking of the coin in the country, Mr. Knox gives an estinate made by the Director of the Mint, placing the amount of gold coin and oullion in the United States, October 31, 1877, at about \$185,000,000 in value, while the silver coin and bullion amounted to about \$50,000,000. Reasonable persons will be likely to conclude that both these metals are needed to maintain convenient currency of specie and redeemable paper, and will advocate the only system by which both can be maintained in concurrent circulation. Of course it is plain enough that to' demonetize gold (as the Bland bill, in fact, loes) is to leave no basis at all for resumption.

ANNUAL REPORT OF THE DIRECTOR OF THE MINT TO THE SECRETARY OF THE TREASURY, FOR THE FISCAL YEAR ENDED JUNE 30, 1877. Washington. 1877.

Dr. Linderman's report, like those which he has made in former years, is full of information, clearly stated, and well arranged. In addition to this there is a prief argument on the question of silver remonetization, and the double standard, which puts the theory of the case in a nutshell. The Director maintains he courage of his convictions, and declares, in spite of all the clamor of the imes, that the legal tender of the silver dollar should be limited to an amount sufficient to prevent it from expelling gold from the country. This is a very neat phrase, and carries within it a whole argument. Another argument is killfully suggested by the notice that, if the double standard should be estabished, and the coinage for depositors of unlimited legal tender silver dollars should be authorized, the mints and treasury offices will need to have new and arger vaults at once. The fact suggested is that under such a system all holders of silver will at once rush with it to the nearest Treasury office, deposit it, and receive for it certificates, redeemable at any time in silver dollars. These certificates, being much more convenient than the dollars they represent, will circulate in their stead, and the Government will be in the position of custodian, without pay, of immense quantities of silver bullion. The amount which the nints, running at full capacity, can coin in a year, is \$24,000,000; with extra appropriations, extra force, and some risk to machinery and to accuracy of work, perhaps \$30,000,000. The amount which would be deposited is, of course, nuch larger.

The director makes the following estimate of the "present average production" of gold and silver from the mines of the United States, "based upon the production for the first six months of the year, and the average monthly turnout since, so far as it was possible to ascertain the same." We infer (since the report is dated in November) that the estimate is made for the calendar year

10//.			
State or Territory.	Gold.	Silver.	Total.
California	15,000,000	\$1,000,000	\$16,000,000
Nevada		26,000,000	44,000,000
Montana	3,200,000	750,000	3,950,000
Idaho	1,500,000	250,000	1,750,000
Utah	350,000	5,075,000	5,425,000
Colorado	3,000,000	4,500,000	7,500,000
Arizona	300,000	500,000	800,000
New Mexico	175,000	500,000	675,000
Oregon	1,000,000	100,000	1,100,000
Washington	300,000	50,000	350,000
Dakota	2,000,000		2,000,000
Lake Superior		200,000	200,000
Virginia	50,000		50,000
North Carolina	100,000		100,000
Georgia	100,000		100,000
Other sources	25,000	25,000	50,000

# NOTE UPON THE COST OF IRON RAILS AS MADE IN 1866 IN A LEADING ENG-LISH RAILWAY COMPANY'S ROLLING MILL.\*

By P. Barnes, New York.

The tabular statement accompanying this note shows the money cost in each of the three departments of manufacture, of 17 leading items, and also the proportion (expressed in a decimal fraction) which each of these items bears to the total cost.

The attempted which is a statement when the st

The statement can hardly be taken for more than an average illustration of the clear showing of ratios and of results which may be made by such an arrangement, for not only will these items vary from month to month in any given works, but the methods themselves of manufacture differ widely in dif-

It is obvious that such a statement, however useful it may be, must be submitted with but exceedingly little explanation or discussion, or with none at all, for the reason that to enter at any satisfactory length upon the merits of the case would require a paper far exceeding the limit of this note:

		Puddling Forge, Blo					Mill	
TICILI.	Classification	Money cost.	Fraction	Money cost.	Fraction.	Money cost.	Fraction.	Item.
1	Coal	£326		£255	'053	£289	'028	-
2	Pig iron	1,460						
3	Serap tron	473	135	78	016		1007	
Į.	Old castings	116						
	Turnings	249	'073			******		
)	Puddled bars	*******				3,515		
1	Old rails			3,591	754	486	'048	
1	Cobbles, etc			140	'029	*******		
,	Scrap from blooms							
	Blooms	*******	***** **					
	Labor	443	128					
	Fire brick and clay	45				8	,001	
	Castings and bar iron					******		1
	Repairs	48						
	Stores	23						
	Interest on capital	25	'007					
7	General expenses	17	*005	17	*004	65	,006	1
3	Total f oting	£3,420		£4,772		£10,073		1
4	Unit footing		1 000		1'000			
)	Credit deduction			1,6		837		1
1	Total cost, £ sterling	£3,429		£4,636		£9,236		
2	Product, 4 weeks, tons		tons, soo		tns 1000		tns, 1401	1
3	Cost per ton, £ sterling		£4.81		£4 50		£6'50	į.
1	" American gold, \$4.84		\$ 28' 12	1	\$22 21	1	\$21.80	1

#### COLORADO STOCKED MINES.

### Staff Correspondence of the Engineering and Mining Journal.

The American Mine has recently declared a dividend of one per cent. We are informed, on good authority, that the mine is not producing enough ore to cover this dividend. Prospecting in the American is going on vigorously, with, as yet, no results of any importance. The reported great strike has not turned out to be as valuable as was at first supposed.

ont to be as valuable as was at first supposed.

The Hukill is employing about thirty men and is producing heavily. Work has been begun upon the stopes, which show nearly ₹600,000 in sight. We understand that the mine is, at the same time, being further developed.

The Miles Concentration Works, at Idaho, are handling all the ore, the low grade being dressed, while the nigh grade is being sampled and sacked for shipment. The Hukill we believe to be now under good and careful management. It is thoroughly capable of paying good dividends out of ore produced, and is, in every way, a good stock for investment.

The Boblail, the finest mine on the New York Exchange List (from Colorado), maintains a steady and even yield, and has done so for some time past. It is under the best of management, and is so extensively developed as to preclude all danger from occasional pinches in the vein.

The Belle of Memphis property is still idle. This stock was killed by rascality among Wall Street Brokers, and will require some time for revival. The time is a good one, however, shows an unusually large body of quartz on the surface, which can be made immediately available if the necessary works results treatment are erected, and should be able without difficulty to support its capitalization, if provided with working means and managed.

A paper read before the American Institute of Mining Engineers, at the Wilks-Barre meet.

\* A paper read before the American Institute of Mining Engineers, at the Wilks-Barre meeting, May, 1877.

with care. The recent newspaper attacks on its principal owner, and on others connected with it, have fallen to the ground of their own weight, and it has been ascertained that the Colorado correspondent of a contemporary publica-tion, who furnished all the thunder for the attack, had never been in the mine, and was therefore thoroughly incapacitated from passing judgment upon it. The Memphis is as yet but slightly developed, but presents many fea-tures of encouragement to one who examines its prospects intelligently and

tures of encouragement to one who examines its prospects intelligently and honestly.

The Scaton is still idle. An incumbrance of \$3,000 rests upon it, as a legacy of the old management—money borrowed to pay dividends with. The company is endeavoring to lift this obligation. Gen. F. L. Vinton, the superintendent, will begin work as soon as this is done. The mine is undoubtedly one of value. It shows a vein that is regular, strong and highly ore-bearing. The property needs, however, some additional development, and some machinery. If re-opened under the present superintendent, it will, beyond question, be honorably and wisely managed. orably and wisely managed.

#### UTAH MINING NEWS.

#### Special Correspondence of the Engineering and Mining Journal. THE BINGHAM CANON GOLD STRIKE,

Special Correspondence of the Engineering and Mining Journal.

THE BINGHAM CANON GOLD STRIKE.

Some six months since rumors were circulated of a rich gold strike in Bingham. The fact proved to be that rich gold quartz was struck in the Rainbow and Steamboat claims, on the west side of the mountain dividing main Bingham from the head of Muddy Gulch. Considerable quantities of quartz showing free gold were extracted, and as there was promise of the ground proving valuable there was no difficulty in finding a number of owners. As much of the ground lay within the patent of the Jordan mine, a compromise was effected satisfactory to all parties, and the property saved. This strike is either on the same vein or a parallel one to that on which the Last Chance, owned by an English company, is located. The Last Chance is one of a system of veins in porphyry, found near the head of Bingham Cañon and its branches, contained either between porphyry walls or between the porphyry and quartzite. They are, in some cases, of later date than the great lead veins, and are distinguished by the different character of the ores contained, as well as by the difference in occurrence, the first being fissure veins cutting the strata in dip and course, the lead veins, however, conforming in general to the lay of the strata. The ore found in the fissure veins is a mixture of blende, galena, iron, copper, and arsenical pyrites, with the silver occurring in several forms, and usually a notable quantity of gold. I have also detected the presence of tellurium and selenium in some of these ores. The percentage of lead is usually low, and that of zinc high, while the silver content is very variable.

### THE "LAST CHANCE" OF THE BRITISHERS.

THE "LAST CHANCE" OF THE BRITISHERS.

From the upper works of the Last Chance ore was taken which assayed very high in gold, the last shipment being somewhat over \$300. This ore from the upper works found a ready market, owing to the silver and gold content, but at a depth of about 400 feet on the vein the water level was struck, when, the character of the ores changing from oxidized to sulphuret, they were no longer salable at fair rates on account of their retractory nature. The vein is from two to four feet wide in the lower works, below the lower tunnel, and the ore is rich, but being unsalable in its natural condition, and the company having no money to spend upon dressing works, the property has lain idle for upward of a year. The end will probably be that this property will go where nearly all other English mining property has heretofore gone—be sold to satisfy some small judgment, and, the term of redemption having expired, pass out of the hands of the company. Doubtless the English mining investor is a much abused individual, but if a balance was struck between his merits and receipts in the majority of cases the sums would balance. Their mismanagement is proverbial, but is not their only fault, as dishonesty toward their creditors is frequently an accompaniment. The average company in Utah has always been willing to draw every dollar from its mines which they will produce, and pay no bills for supplies as long as they can delay. When the time of settlement finally comes, should the mine not show that there is profit in paying up, then the creditors can do their best, the property is abandoned, and the stockholder is swindled by the Yankees. But they have just taught the Yankees a new trick by giving one and the same person three powers of attorney, one for the company, one for the trustees, and the other for the debenture holders. No one knew exactly who was running the concern, and as the attorney denied his responsibility in his several capacities, and as the mine was not liable, why creditors could

The Flagstaff mine, which is now owned by W. S. McCormick, who bought it in at sheriff sale, held it six months for redemption, and then received his deed. What the next move is cannot be guessed, but probably a notice that the company has been swindled. In any event it is now without mine or other property, and unsettled debts to the extent of over \$300,000. The Euglishmen cannot be guessed by the state of the state perty, and unsettled debts to the extent of over \$300,000. The Enginsmen cannot complain of any one but themselves, since they have had ample warning of the condition of affairs through a party who, disappointed in his aspirations to become the resident agent of the company, has devoted his time gratis to publishing all the accessible facts and rumors in regard to the company's affairs. The probability is, that before long the Flagstaff shareholders will be called on The probability is, that defore higher translations will be called on for voluntary assessments, amounting to more than the company's indebtedness, for the purpose of sung some one for doing what they failed to do—conducting their business in a capable manner, and taking advantage of a good thing. I wonder how it is that most people lose all they have invested before they learn that mining requires some little business caution, and, being a peculative affair in general, should no more be allowed to care for itself than mercantile ven-

#### THE OLD TELEGRAPH.

Yesterday, eleven of seventeen suits were commenced in the courts here against L. E. Holden, of the Telegraph Company, by his former fellow share-holders in the company, they alleging breach of trust and conspiracy to defrand on his part, and asking the rescission of the purchases of their stock, on the ground that the sales were made upon the basis of representations showing the mine to be non-productive, while it was, in reality, paying large profits.

And so it goes. Pending the decision of the above suits, the appointment of a receiver is asked. It is to be hoped that matters may be so arranged that work may continue in the company's mines, and the orea continue to come in the market, as the output from these mines constitutes the principal lead ore supply of our market.

S. C.

supply of our market. SALT LAKE CITY, December 9, 1877.

#### A HISTORY OF TUNNELING DURING THE THIRTY-FOUR CENTURIES SUCCEEDING THE REIGN OF RAMESES II.\* - II

HINDU TUNNELING

The Hindu† caves and rock-cut temples are not as ancient as those of Egypt, the oldest dating back only to between the second and third centuries B.C., whereas the Ipsamboul Temple, above described, is said to date back as far as 1500 B.C., or to the reign of Rameses II.

These Hindu caves occur in groups, the number in a group in some cases reaching as high as 100 distinct excavations. It has been estimated that, in all, there are not less than 1,000 of them, of which 100 may be of Brahminical or Jaina origin, and the remainder Buddhist; the large majority of the latter being used as monasteries. Nine-tenths of the caves now known are within the confines of the Bombay Presidency; owing probably to the fact that the rock in that locality is especially adapted to the work, being composed of various trap formations of uniform texture, and occurring in abrupt perpendicular cliffs with few flaws or faults in the rock. The earliest work seems to have been done about 543 B.C., in improving the Satapanni Cave in the Behar group in Bengal; this, however, was simply a natural cave embellished with ornamentation.

The earliest cave excavated is the Sudama or Nigope Cave, cut in the twelfth year of the reign of Asoka, or about 260 to 264 B.C. Fig. 3 shows the fagade of the cave at Bhaja, also of about this date; and it is interesting to note that in these early examples of stone work, the columns slope inward. The reason assigned for this curious conformation is that the caves were cut in imitation of the earlier wooden roofed temples, and the supports were thus sloped with

assigned for this curious conformation is that the caves were cut in imitation of the earlier wooden roofed temples, and the supports were thus sloped with Eastern fidelity to detail, so as to conform to the inward slope of the rafter supports of their wooden structures. Later come the caves of Nassick, about 129 B.C. It should be noted that, in all this most beautiful early tunnel work, there is not a particle of stucco or masonry. It was all pure laborious cutting with hand tools in the hardest of rock: and, undoubtedly, except perhaps in the center excavations of the largest caves, it would have been out of the question to risk shaking or cracking the rock by any fire-setting excavation.

The caves of Karli date about 78 B.C.
and elevation of the largest one, and Fig.
4 a view of its interior; in it we see that

and elevation of the largest one, and Fig. 4 a view of its interior; in it we see that the early architectural defects are gone; the pillars of the nave are quite perpendicular, and in it the style of ornamentation reached a perfection never afterward surpassed in the Indian temples. The Karli caves and those of Ellora are the most magnificent in India; the latter range from 200 to 300, and some perhaps to 600 A.D., and their passages and ex-cavations amount in all to over two leagues cavations amount in all to over two leagues of underground work, a pretty strong example of primitive tunneling, executed by men who, though they perhaps knew of gunpowder, certainly seem never to have applied at to blasting, and to whom dynamite was not even a visionary suggestion of the distant future. Later came the caves of Salsette (about 500 A.D.), both on islands near Bombay. Still later (about 1400 A.D.). the Gwalior caves were excavated; these were among the latest cut, and are located further north than any of those previously cited.

latest cut, and are located further north than any of those previously cited.

Among the very famous open air rock-cut temples of Ind a should be mentioned those of Bamian, in Afghanistau, cut in the rocky sides of a pass through the Hindoo Koosh range. These open air temples, however, though undoubtedly rock work, are not connected with tunneling proper. Many of them, it is said, have been defaced by the vandalism of the English. This we can readily believe; troops, for instance, who would stable their horses on the magnificent tessellated floors of Delhi, would not hesitate to deface what would appear to them the ruder structures of a so-called un-

tate to deface what would appear to them the ruder structures of a so-called un-civilized race. Indeed, we are told that the barbarous civilization of the nineteenth century has actually sanctioned the construction of a railway through the Bamian Pass, in the course of which many of these beautiful temples have been destroyed.

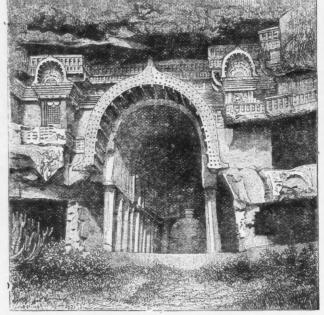


FIG. 3.—CAVE AT BHAJA

#### THE METER AS A STANDARD. By Gen. Francis L. Vinton, Denver, Col.

We need a straightforward decimal system of weights and measures, and, practically, it matters little what unit of length the system is based on, provided it have some convenience and permanence; but when nations are urged to adopt a general standard, an unexceptionable one should be selected, and the metrological societies would do well, therefore, to propose some better dimension than the meter, which the French themselves are ridiculing, at the very time we seem to fancy it a major thing.

sion than the meter, which the French themselves are riddening, at the very time we seem to fancy it a magic thing.

Those Americans who have studied more or less in the French and German schools, and still incline to this fancy, will find increasing difficulty to force the meter into practical building here, because at present every carpenter's and mason's rule is divided, at least on one side, into feet, tenths, and hundredths, so securing the facility of the decimal notation, which is the sole advantage of the matrix exists.

Were our pound and bushel referred decimally to the existing "foot standard, we should be equipped as scientifically as any people in weights and measures; but if the whole question be made to hinge on the desirability of some universal criterion, we may, before we approve a change, at least demand

that the standard be something in nature fulfilling certain rational conditions. Some length, in short, positive, exact, invariable, and, above all, easily got at by direct observation, without elaborate calculations, involving partial developments, all sorts of approximations, incommensurable quantities, coefficients, and factors absolutely incorrect, or totally unknowable.

An actually measured length between two indestructible points on the ground, might engine and standard and the rester heavy solvers of the rester heavy solvers.

An actually measured lengta between two indestructible points on the ground, might suffice, awkward as it is, but the meter bears only a false resemblance to that. It is supposed to be, and was seriously intended to be an aliquot part of a meridian of the globe, a ten-millionth part of a quarter, as is quite historic. But no quarter of a meridian has ever been measured, or ever can be; and, moreover, the figure and dimensions of the earth, independent of its weight, considered as standards of precision, are preposterous. The earth is not an ellipsoid, the meridians are not ellipses, not even similar curves, nor are any two probably equal in length; the flattening of the earth at the two poles is not the same; the so-called eccentricity is no settled ratio, even if it can be said properly to exist; and, in a word, this planet resembles in form a potato more than anything geometric. When degrees of latitude were first measured, they were invariably, as it happened, found shorter toward the pole, instead of longer, and even now, in the best are of ten degrees ever measured, the law of increase does not absolutely show, because the curvature of the surface is so variable.

Since, therefore, the true length of a meridian cannot be measured nor calculated exactly, and only a supposititious one can be estimated, it follows that the

Since, therefore, the true length of a meridian cannot be measured nor calculated exactly, and only a supposititious one can be estimated, it follows that the meter is no more than a blank assumption enveloped in mathematical clouds, as purely a dogmatic standard as the foot or barleycorn; worse than that, it is not even the phantom it pretends to be, for the French savants in measuring for it committed errors such that the prototype meter in the Archives is shorter in fact than it is in theory. First, Mechain made the arc between Mountjoy and Formentera too short by 69 toises; and secondly, the commission of weights and measures assumed the square of the eccentricity notably too little. This famous measurement and calculation were imagined and commanded by the French assembly May 3, 1799, about the time the nation, dressed in the garb of Agamemnon and La Belle Helene, worshiped the Goddess of Reason and rebegan chronology. Their classic costume, months, and years have disappeared, and they are ashamed of their meter also. They know well, of course, that it is too short,

know well, of course, that it is too short, but they make an additional mistake in saying, "It would not be worth while to go over the labor of those great astrono-mers; we have only to take the legal length mers; we have only to take the legal length of our platinum meter at a temperature of one-tenth of a degree above zero instead of that of melting ice." If any combination of ingenuity can make a more arbitrary standard than the meter, then it will be higher than the highest mathematics. It appears, therefore, that, had the French assumed their old royal foot for a unit, called it a meter, and based their system thereon, we should have had the same reason for displaying our standard by it as this pretentious folly. The general talk about the meter in our country disseminates error; and it ought to be moderated, nates error; and it ought to be moderated, or, better, abated as a nuisance. As for a or, better, abated as a nuisance. As for a real standard, it is easy to find one. Standard time, latitude, and the earth's attraction at a given place are invariable and easily measured. The distance a body falls in a second at the Observatory of Paris, if you please, is the best basis for weights and measures. Others have been suggested; but, finally, it is incontrovertible that, with our present instruments of precision, the acceleration due to gravity can be measured more accurately than any line on the farth's surface; and, moreline on the (arth's surface; and, more-over, it will mean something, and "be there every time," as they say in the

### "THE LOWE GAS AND PROF. MORTON."

### By Henry Morton, Ph. D., President of the Stevens Institute of Technology, Etc.

The logic of Mr. Dwight in his article in the last number of this JOURNAL, under the above title, is so exactly like that of Mrs. Nickleby, and therefore so completely unanswerable, that there is nothing left for me but to acknowledge with good grace my entire inability to contest the ground with him, and retire from the field.

from the field.

Admitting for the sake of argument, though it happens not to be the fact, that Prof. Rogers was my successor in the chair of chemistry in the University, this, of course, proves that the animus of my report on the Harrisburg water gas must have been very bad indeed.

Similarly an analysis of the Manayunk gas, signed jointly by him and Prof. Stevens, must be an analysis of the gas made at Harrisburg on the 20th of October, because Profs. Genth and Sadtler have on some other occasion made an analysis (not published) which Mr. Dwight asserts disagrees with mine.

Under such a storm of solid facts and logical deductions, it would evidently not be courage but folly to resist.

Add to this that a gentleman who has received an honorary degree from the

Add to this that a gentleman who has received an honorary degree from the Stevens Institute should in past time have thought well of the Lowe process,

and the cup of my iniquity overflows.

The only thing left for me to do in such a state of affairs is to assist the disinterested labors of those gentlemen who "have pledged themselves to the development of the system upon its merits."

This I propose to do by making further analysis of water gas wherever I find it, and publishing the results, together with any other facts bearing on the question which may come within my knowledge.

<sup>\*</sup> Extracts from advance proofs of A Treatise on Tunneling, Explosive Compounds, and Rock Drills, by Henry S. Drinker, Mining and Civil Engineer. Published by John Wiley & Sons, New York.

† See Fergusson's 'llustrations of the Rock-cul Temples of India, and his History of Indian and Eastern Archiceture. Also General Cunningham's Archeological Reports; and Monuments Anciens et Modernes, par Jules Galihabaud.

Sale of a Black Hills Gold Mine.—A dispatch from Deadwood City dated December 18 says. "The 'Old Abe' mine, situated near Lead City, has been sold to parties from Lake Superior for \$50,000."

#### A CONVENIENT METHOD OF CALCULATING ASSAYS.

To the Editor: Sie—The method of calculation ordinarily employed, and recommended by Fresenius, for reducing to troy ounces per ton the amount of silver obtained from our test assays, is quite complicated, and liable to lead to mistakes on account of the amount of figuring required. We employ!a method in the works here very simple, requiring no figuring, and also saving much time, which may not be known to all of your readers, and hence may be interesting and useful to some. This is based on the fact that there are 29,166+ troy ounces in a ton of 2,000 lb. Now, we take a quantity of ore or bullion that represents a ton—say 29,166+ milligrams or 29,166+ grams, and divide it into three equal parts. For this purpose we have a weight or quad which is exactly counterbalanced by 9,722+ grams. The 9,722+ grams is the most convenient sized button to make, and besides we make three assays at the same time; however, any fraction of 29,166+ may be used. The three weighed quantities of ore or bullion are subjected to the ordinary process of assay, keeping each in a separate cupel, of course. The combined weight of silver buttons obtained in milligrams will give the number of troy ounces per ton of 2,000 lb. It will be ob-erved that the silver may be calculated seven different ways—combined, separately, etc. This method may be applied in any case where any fire assay is used. We have used this process of calculation in the assay office of the smelting works here for some time, and find it very accurate, besides a saving of time and figuring. Chicago, Dec. 11, 1877. TO THE EDITOR: SIR-The method of calculation ordinarily employed, and a ton—say 29,166+ milligrams or 29 166+ grams, and divide it into three equal parts. For this purpose we have a weight or quad which is exactly counterbalanced by 9 722+ grams. The 9 722+ grams is the most convenient sized button to make, and besides we make three assays at the same time; however, any fraction of 20,166+ may be used. The three weighed quantities of ore or bullion are subjected to the ordinary process of assay, keeping each in a separate cupel, of course. The combined weight of silver buttons obtained in milligrams will give the number of troy ounces per ton of 2,000 lb. It will be ob erved that the silver may be calculated seven different ways—combined, separately, etc. This method may be applied in any case where any fire assay is used. We have used this process of calculation in the assay office of the smelling works here for some time, and find it very accurate, besides a saving of time and figuring. Chicago, Dec. 11, 1877.

C. B. G.

The Committee on a Standard Gauge have been constantly engaged, since their appointment, in the duties assigned to them. They have corresponded with different persons interested in the manufacture and use of ganges in this country, and have received from several of them important information.

They have also entered into

have received from several of them important information. They have also entered into correspondence with the Gov-ernments of England, France, Germany, and Russia through their consuls, and with Austria directly. The consuls of Ger-many and France have taken the greatest interest in the matter, and have communicated to your committee a large amount of and have communicated to your committee a large amount of valuable information relating to the gauges used in their countries. Prof. Tunner, of Leoben, Austria, one of our honorary members, has communicated information relative to the uses of gauges in Austria. The relies to the communications ador gauges in Austria. The replies to the communications addressed by the English and Russian consuls to their respective governments, have

Russian consuls to their respective governments, have not, as yet, been received.

Your committee commenced its labors, having in view to find a gauge which should be simple in its construction, not readily worn, capable of easy adjustment, and not too expensive to be used by the ordinary workman With this in view, they have examined a nary workman With this view, they have examined

differ according as they are made by different manufacturers, but in a package of a dozen made by the same manufacturer there often were very perceptible and annoying differences. They find that in the gauges with open slots the sides are rarely parallel, and that there are even greater variations in them than in the gauges made with closed round holes without plugs. They find that the numbers affixed to the slots and holes vary so much, on account of the differences in the width of the slots and in the diameter of the holes, as to be a constant source of inaccuracy, uncertainty, and annoyance. This variation has, in certain cases, been found to amount to as much as 50 per cent. of the weight of different wires of the same number which have been examined. It is, therefore, impossible to make even an approximative comparison of sizes, unless, besides the

is evident that, in order to have such a gauge even moderately accurate, it must be a very ex-pensive instrument, and alto-gether beyond the reach of an ordinary workman, or even of a manufactory with small capi-tal; and that from the in-definite multiplication of holes and plugs, it must necessarily and plugs, it must necessarily be very cumbersome. When they are used, there must always they are used, there must always be two such gauges, one for comparison and one for use, and when the gauge is only very slightly worn it ceases to be an instrument of precision and is then open to all the objections of the ordinary gauge with fixed holes.

gauge with fixed holes.

Your committee, very early in the course of their investigation, formed the opinion that no reliance whatever was to be placed on the numbers of gauges, as an indication of size, except for the individual gauge to which the number was attached; and that the only accurate and scientific way of expressing the size of an article expressing the size of an article to be gauged was by some ex-pression of its diameter, which should be more exact than num

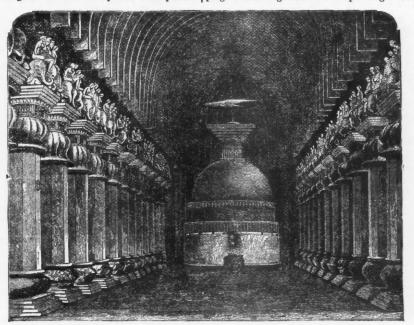


Fig. 4.—View of Cave at Karli. (See page 452).

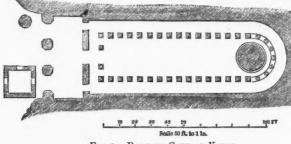


FIG 5 .- PLAN OF CAVE AT KABLI.

Fig 5.—Plan of Cave at Karli.

large variety of gauges, and believe that all those in general use in the United States have passed under their inspection.

We find, as the result of our examination, that, although there are a great number of patterns, most of the gauges in general use differ but slightly in principle. The different systems may be divided into two general classes. These are—first, fixed; and, second, movable gauges.

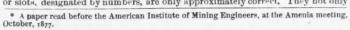
Of the fixed gauges, there are three general types. These are, first, those made with slots, open at one end, the sides of which are intended to be parallel, as the ordinary wire gauge; second, those made with round holes made in a plate, with or without a plug corresponding to each hole to check the size, such as the Whitworth gauge, and the Stubbs wire gauge, better known in this country as the "twist drill" gauge.

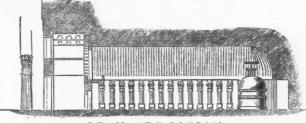
In both these kinds of gauges, the slots and holes are designated by numbers. The third kind of fixed gauge consists of a V, either cut into a sheet of steel, or formed by placing two bars of steel together at one end, and leaving them open at the other a fixed distance.

Of the movable gauges there are two types: Sliding calipers with verniers, with or without a micrometer screw for adjustment; and the micrometer screw gauge.

Screw gauge.

Your committee find that the gauges which are characterized by round holes or slots, designated by numbers, are only approximately correct. They not only





Section of Cave at Karli. Scale 50 ft. to 1 in.

Frg. 6.

bers, and which would allow of an accurate comparison of all the dimensions by

whatever gauge they were taken.

Your committee are supported in this opinion by the present practice among some European manufacturers who have recently acted in this matter, who have decided that a given number on a gauge shall correspond to a given diameter expressed in fractions of the legal standard of length of the country; but as, in

expressed in fractions of the legal standard of length of the country; but as, in all fixed gauges made for ordinary commercial use, the diameter can only be approximately expressed, neither the number nor the diameter is ordinarily correct, so that there is a double source of inaccuracy, as the number does not express the exact diameter, nor the diameter the number.

Owing to the great liability to error, and the impossibility of correcting it, even in the most elaborate forms of this kind of gauge, your committee, early in the course of its investigation, after having themselves examined a large number, and having had communicated to them the results of examinations made by others, dismissed this class as being unsuitable, either from their defective construction, the impossibility of adjusting them when out of order, or their great cost, from their consideration as a standard gauge.

Your committee next turned its attention to the V gauge, which is made by placing together two pieces of hardened steel, so that they touch at one end, but are open a given distance at the other, the numbers or diameters corresponding to the opening being graved upon one or both of their sides. The accuracy with which measurements can be made with this gauge when it is new, and the jaws properly tempered, adjusted, and fastened, is surprising. Exceedingly

minute differences even in the diameters of the same wires can be detected and measured with great nicety, but by constant use the gauge wears unevenly It must then be taken apart, reground, and readjusted, which will generally comore than the gauge is worth.

Your committee, while having the highest opinion of it for ordinary oses, after some months of study abandoned the idea of recommending it standard gauge.

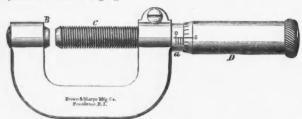
Their attention was then turned to the other two kinds of gauges, namely, the sliding gauge with a vernier, with or without a micrometer adjustment, and the gauge known as the micrometer gauge. The advantage of these gauges is great accuracy. The sliding gauge with a vernier necessarily wears, but the error of wear can be ascertained and allowance made for it, so that accurate measure-

ments can always be made with it when it is worn.

In the micrometer gauge the wearing surfaces are so arranged that they can be adjusted with ease in a few moments. The wear between the male and female parts of the micrometer can be adjusted by a binding screw. This adjustment can be repeated as often as required, so that the instrument will read with great recovery until it is worn out. accuracy until it is worn out.

Your committee assured themselves by actual trial that with such a gauge boys can very easily be taught to read the thousandth of an inch or the fortieth of a millimeter, and that it is practicable to read even the eightieth of a milli-

The micrometer gauge is, of these last two gauges, the simplest. It consists of a micrometer screw, C, with a vernier attachment on D, is susceptible of easy adjustment, is not likely to wear, is not complicated, is less likely to get out of order than the other gauges, is more easily read, and requires less skill to read it than the sliding gauge with a vernier. Your committee are therefore of the opinion that this gauge, which is shown in the annexed cut, is the gauge which should that this gauge, which is shown in be adopted as the standard gauge.



They are of the opinion that all gauges should be graduated so as to read actions of an inch or of a millimeter, and that the sizes should be expressed fractions of an inch as the only means of insuring correct measurements, and not by numbers, which constantly lead to error. That this, while it insures great accuracy, presents no difficulty in practice, is shown by a number of experiments made during a period of several months, to ascertain the practical difficulty in the way of the adoption of this method by a member of your committee. The sizes of some of the steel bars, the orders for which were expressed in thousandths of an inch,

Sizes expressed in decimals of an inch, taken at random from the order book of a manufactory which has adopted this method :

15'5	×	*014	3'00	×	'0145	2'25	×	*059
15	×	*02	3*	×	'018	2'25	×	°C46
15*	×	.014	3*	×	*02	2'25	×	040
5.25	×	.001	3*	×	'0125	2.22	×	.038
4.20	X	*062	2'75	×	'030	2.25	K	'055
4	×	'024	2'75	×	'051	2.25	×	.020
4'	×	'022	2'75	×	'035	2*	×	,018
4	×	'071	2'50	H	'059	1.20	×	'032
3'475	X	'062	2'50	×	'022	75	×	*095
3*25	×	.01	2'25	×	'031	*25	×	'062

The trial of this system by some of the manufacturers has resulted in banishing all the old forms of gauge from their work-shops.

The conclusions which have been arrived at, for the most part independently, by the different members of your committee, and in which they unanimously

agree, are:

I. The abandonment of the system of fixed gauges for commercial use.

2. The abandonment of the system of representing the diameters and sizes by numbers.

The adoption of the system of expressing sizes in thousandths of an inch or fractions of a millimeter.

4. The adoption of the micrometer gauge as the method of measuring sizes.

Your committee beg to acknowledge their indebtedness to J. B. Knight, Secretary of the Franklin Institute in Puiladelphia, for the reports of various comretary of the Franklin Institute in Philadelphia, for the reports of various committees on gauges of the Franklin Institute; to C. Hawitt, Esq., President of the Trenton Iron Company, for a large number of measurements of wire made with different gauges; to P. Ritter von Tunner, of Austria, for the description of the kind of gauges used in Austria; to the German Consul, for his interest in procuring from Germany a report of their gauge system; to the French Consul, for his interest in the work of the committee; and to the Minister of Agriculture, Commerce, and Public Works, for a complete description of the gauge system as used in France.

Your committee is, however, particularly indebted to Dealer and Public Works.

Your committee is, however, particularly indebted to Darling, Brown & Sharp of Providence, who have loaned to them without charge all the gauges which they manufacture for comparison, and have contributed besides a very large amount of information on various matters connected with this subject.

All of which is respectfully submitted.

T. Egleston, Chairman. Wm. Metcalf, Jos. D. Weers.

#### DISCUSS ON.

Mr. A. L. HOLLEY asked if the committee had examined the gauge used by Mr. A. L. Holley asked if the committee had examined the gauge used by the Washburn & Moen Co. and others; it was a screw gauge with a micrometer scale, but the power with which the movable jaw of the gauge was set up against the piece to be measured was not regulated by the feeling of the hand; it was made perfectly uniform, for all sizes of work, by a spring arranged like that in the stem of a stem-winding watch. Hence the pressure of the jaws on the work was perfectly uniform, and the measurement was very delicate and exact.

Dr. Egleston said that the committee had heard of this gauge, and had endeavored to get one, but had not succeeded in doing so, and hence had not examined it.

#### THE FULLER PLACER MINES, COLORADO

Staff Correspondence of the Engineering and Mining Journal. [WITH TWO SUPPLEMENT SHEETS.]

The Journal is illustrated this week with two supplementary sheets, showing views of the more prominent properties of the Fuller Placer Mining Company, and a map of the Swan River, in whose valleys most of the claims of the company lie. The map explains itself in full. Swan River flows from the western slope of the front or main range of the Rocky Mountains, having three main sources, named respectively the South, Middle, and North Swan Rivers. The slope of the front or main range of the Rocky Mountains, having three main sources, named respectively the South, Middle, and North Swan Rivers. The cañon of the first mentioned is cut along the northern slope of an extensive porphyritic overflow, and is gold-bearing at every point of its bed. Its southern banks and ravines, from the valley to the crest of the porphyry divide, carry also deep and rich deposits of gravel. The Middle Swan, from its head to its junction with the main stream, lies wholly in slates and sandstones, while the North Swan heads in granite. These two forks are barren of gold. Passing down the main stream, all the gulches coming in from the south are found to be rich in arriferous gravel, while those on the other side have yielded nothing.

As the formation of this noted gulch will be fully shown in a geological map now in course of preparation, and which will be published in the Journal before long, it is unnecessary to give any further details on this point.

The Fuller Placer Company owns almost all the ground in the South Swan, the whole of Georgia Gulch and its tributaries, large patches on Brewery, Brown, and other gulches west of Georgia, Helen Patch, on the French Gulch divide, and Mayo, Illinois, Boston, Dry, and Negro Gulches still turther south, embracing altogether over 2,500 acres, having an average depth of gravel of 20 feet. The map in one of our supplements shows all this ground, excepting Mayo, Illinois, Dry, Boston, and Negro Gulches, which lie about two miles south of Lincoln City, and includes the entire length of the gulch from the crest of the

embracing altogether over 2,500 acres, having an average depth of gravel of 20 feet. The map in one of our supplements shows all this ground, excepting Mayo, Illinois, Dry, Boston, and Negro Gulches, which lie about two miles south of Lincoln City, and includes the entire length of the gulch from the crest of the divide down to the Blue River.

The history of the Swan River is similar to that of many other placer districts. Entered first by way of Georgia Pass in 1859 by a band of wandering prospectors who were traveling from the Hamilton diggings, the first tests were made in the barren gulches flowing into the river from the north and east, and, of course, no encouragement was met with. Later in the season, however, another party came across the range, and immediately found enormously rich pay in Gold Run, Delaware, Galena, Georgia, and Humbug Gulches. The valley was immediately colonized, and a very lively little town named Parkville sprang up at the mouth of Georgia Gulch. For two years a very heavy yield was maintained. Georgia gulch for its length proved to be the most productive placer ground in Colorado, and both Humbug and American paid in places enormously. Profitable working was also carried on in nearly every gorge entering the Swan and its southern branch from the south, but in a short time the rich pay streaks in the bed of the richest and most accessible gulches were washed out after the rude fashion of the earlier miners, and it was found that, to work the upper parts and side claims of gulches, extensive and costly ditches were required. This necessity immediately put an end to the flush times, and resulted in an almost total abandonment of the valley and its mines.

In 1871, Col. Thomas H. Fuller, of Boston, Mass, the treasurer and principal stockholder of the celebrated Globe Nail Company, became interested in the mines, purchased certain water-rights and ground, which gave him command of the entire upper parts of the Swan River. From that date onward, Col. Fuller and the company that bears h

tween the Swan and French.

In order to open this ground and work it profitably a flume was projected to take the water of the North, Middle, and South Swan Rivers at their head, and bring it around to the head of Humbug and other rich gulches whose deep banks were found to contain gold in paying quantities up to the top of the divides, from which they flowed. This flume is at the present date completed to the head of the Middle Swan, is thirteen and three-quarters miles in length, has a section of four feet two inches by four feet, and is capable of delivering 2,400 inches of water per day. It is solidly built of sawn lumber from end to end, and can be boarded up at the sides so as to increase its carrying capacity by 2,000 inches, if desired. This has not yet been done, because the flume is at present sufficiently large to carry all the water of the streams it crosses, but when it is extended seven miles farther to the North Swan this addition will be needed and will be made. ed and will be made.

ed and will be made.

Among our illustrations to this property is one showing the entire range of mountains from the head of the Middle Swan around to Brown's gulch, on whose flanks will be noticed the course of this great flume as it winds around from ravine to ravine, bearing the element which is destined gradually to tear away and destroy the magnificent forest which now crowns each slope. The point of view selected for the picture gives one of the finest scenes to be obtained anywhere along the course of the Rocky Mountains in Colorado. Mount Grant and Old Rolly the two promisent peaks of the vicinity, reaching for Guyot and Old Baldy, the two prominent peaks of the vicinity, reaching far up above timber line, barren and capped with snow, form an imposing back-ground, against which the green slopes and the deep-cut gulches present a strik-

Of course but a small portion of this large area is as yet under work.

Of course but a small portion of this large area is as yet under work. It requires time to open a placer mine as well as a quartz lode. Preparatory pits must be sunk, flumes built, and connection made with the great supply flume. At present five of the gulches in the property are in a working and producing condition. These are the Dry, American, Humbug, Little Georgia, and Mayo. Our second illustrated sheet gives accurate views of each of these, the two first being presented together, as Dry is a tributary of American. Humbug, the richest gulch next to California cañon yet found in the State, is the eastern fork of Georgia. It is about 5,000 feet in length, and gradually disappears on the steep divide between the Swan and French rivers. There is one large pay streak on its lower part, but up towards the head the streak divides and the gold becomes coarser. The illustration gives a fine idea of the extensive workings carried on in the lower parts, and the operations now in progress above. Two giants have been at work during the past season, one on each side of the gulch. The head of water attainable is 300 feet, and it will be possible to wash down the banks in a direct line several hundred feet farther before the flume is reached. The ground pays well far up the mountain side, and, in fact

is rich clear to the summit of the ridge. The production from this gulch has averaged during the last season \$25 per day to the man. An immense area of ground is yet untouched, besides which, as the sketch shows, there is a piece of ground in the center of the gulch, several hundred feet in length, still remains.

Little Georgia is the western fork of Georgia. The pay streak was lost at the mouth of this ravine in the early day, and was not found again until last season, when the Superintendent of the Fuller Company made explorations some distance when the Superintendent of the Fuller Company made explorations some distance above the mouth, and found not only good pay, but plenty of it; the bank being very deep and the ground unusually good. Our illustration is taken from the head of the gulch looking downward, and shows the giant in the foreground playing against the deep banks of the pit. In the middle distance is the sluiceway, and in the background the bald-headed mountains, among which rises the North Swan River. Operations in this channel have just begun. The ground is almost wholly new, and will not be exhausted for many years. During last season the average yield of dust

per man was \$20. per man was \$20.

Dry and American gulches (represented together in our supplement) are also quite recently opened, though work has been prosecuted with great vigor in both. Each bank is supplied with a Giant with a head of 300 feet. By referring to the map the reader will notice that these two gulches are parallel to Geor-gia, and flow from the same divide from which all the gold of the Swan River has originated. During the past season Dry has yielded \$10 per day to the man employed, and American \$22. Both promise to be as valuable as any ground owned by the company. American was the first gulch worked in the Blue

Valley.

Mayo gulch flows from the divide between French and Illidivide between French and Illi-nois, and heads in the formation from which Nigger gulch runs. The latter has been worked con-tinuously from the earliest days of the country, and has always paid handsomely. It is to-day one of the most valuable ravines paid handsomely. It is to-day one of the most valuable ravines in the valley. At its head, and consequently at the head of Mayo, is a large outflow of the same porphyritic trachyte, which occurs on the divide between the French and the Swan. The claim of the Fuller Company comprises the whole length of Mayo, and 600 feet in width. Two Giants are in operation, deriving their water from the head of Illinois gulch. Mayo is very even in its yield. It has paid regularly about \$20 per day to the man. Its banks are deep and easily worked. The supply of water is sufficient to work the deposit up to its head.

Since the Fuller Company took hold of the ground and began to work it, the production has, of course, been comparatively light because some time was required to build the immense flume and to place all the other present improvements on the ground.

to build the immense flume and to place all the other present im-provements on the ground. These improvements consist of fifteen good cabins, boardings houses, offices, feed ditches, a saw-mill capable of sawing 7,000 feet of lumber per day, rabbeting feet of lumber per day, rabbeting machines, tonguing and grooving machine, accessible roads from one point to another upon this immense property, and in fact everything necessary for the working of the mines and the comfort of the officers and min-

would ultimately find its way into the Gulf of Mexico, over to the westward slope, where it passes after a journey of nearly 3,000 miles into the Gulf of California. There is no other place on the continent, we believe, where Atlantic waters are diverted to the Pacific.

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Col. Fuller, the former owner of this property, and President of the Fuller Placer Mining Company that succeeded him, has developed this valuable ground in a systematic, careful, and intelligent manner, sparing no money, where it could be advantageously spent. As a result the company has to-day one of the finest placer properties in the West. If Colorado had more men of his style and financial ability, a very notable increase in her bullion yield would be the result.

#### HAYDEN'S SURVEYS.

The New York Tribune, under date Washington, November 25, says: Dr.

Hayden, director of the United States Geological Survey, has prepared his annual report to the Secretary of the Interior, and the following is a synopsis of the most interesting portion of it.

"On the completion of the survey of Colorado last year, it was determined by the Department of the Interior, that the work of the geological and geographical survey of the Territory, under the direction of Professor F. V. Hayden, should be transferred to Wyoming and Idaho. The to Wyoming and Idaho. The belt of the country along the Pacific Railroad having been explored and mapped in detail by the survey of the 40° parallel, it was deemed best to begin at the northern line of that work, and continue it westward from the longitude of Fort Steele, Wyoming Territory, to that of Ogming Territory, to that of Og-den, Utah, and northward to the Yellowstone National Park.

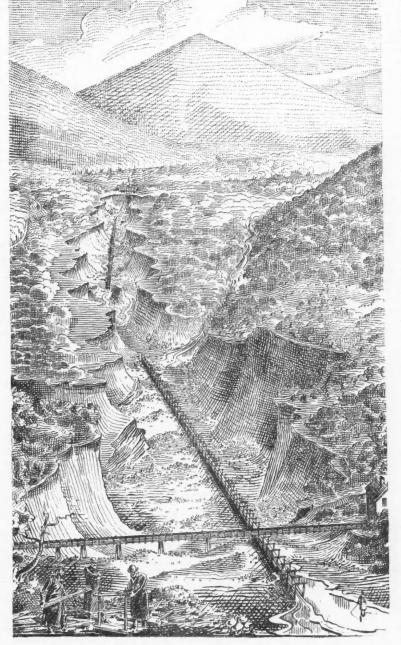
Yellowstone National Park.

"The survey during the past season was divided into six parties, one of which was engaged in primary triangulation; three had charge of topographical and geological work; one of critical paleontological study, and one of making level connections. There were also three smaller parties. were also three smaller parties engaged in special investigation

engaged in special investigation in different parts of the West.

"The primary triangulation party began work at Rawlins Springs, Wyoming. From that point a base line was laid down with great accuracy, from which a network of triangles was constructed, and landmarks were set up at intervals of from twenty to up at intervals of from twenty to thirty miles. The primary sys-tem was extended with great care over an area of 25,000 square miles, establishing twenty-six main stations. The three well equipped topographical and geo-logical parties surveyed an area of 28,535 square miles. In accordance with instructions from the Department, stone monu-ments were built at all of the im-portant geodetic stations for the portant geodetic stations for the suse of the surveyors of the public lands, under the direction of the Commissioner of the General Land Office. The entire number erected was 225. As soon as the topographical work is sufficiently topographical work is sunctiently advanced a chart will be pre-pared, showing the locations of all the monuments and their re-lations to the arable public lands. Careful attention was given to the Sulcy.

Gulcy.



MAYO GULCH.

TTLE

GEORGIA

GULCH

are two quarto volumes on vertebrate for sils of the West, one on the fossil insects, and one on the rhizopods. The atlas of Colorado, which was described in the last annual report, will be completed about February, 1898. The tenth and eleventh annual reports of the survey are well advanced, and will be printed and ready for distribution before the close of the regular session of Congress.

"In 1872, the organization of the survey was matured on a basis of an annual appropriation of \$75,000, with \$20,000 for the engraving of charts and illustrations of reports. This amount was granted until the past two years, when the appropriation for engraving was omitted, which has caused the preparation and publication of the more important works of the survey to be greatly impeded. The estimate for the fiscal year ending June 30, 1879, is \$75,000.

#### THE BORAX MINES OF NEVADA.

Many of the most wonderful and valuable discoveries and inventions, both ancient and modern, have been accidental. Notable instances will be readily called to mind by the intelligent reader, no: only of the discovery of gold and other mines of great value, but also the germs of such great and useful arts and inventions as printing, steam, electricity, and various kinds of mechanism. Among the modern and indeed recent discoveries of great value to mankind, one in our country is particularly noteworthy. It is that of the discovery of a mine or vast bed of borax, by which a most useful and necessary article, instead of heing an expensive luxury as formerly is rendered so chean as to bring it of being an expensive luxury as formerly, is rendered so cheap as to bring it within the means of all classes.

within the means of all classes.

This remarkable discovery was made in Esmeralda County, Nevada, some four years ago, by a young man who was prospecting for gold and silver mines. While thus engaged, traversing mountains, cafions, and valleys on horseback, he saw, in a valley known as Teel's Marsh, what appeared to be a vast bed of white sand, resembling dry sea foam. The appearance was so novel and singular that he dismounted and descended to prospect the object. Upon arriving at the place, he found it to be the bed of a dry lagoon with the appearance of having been dry for centuries. Walking cautiously over the place, he found the surface to be soft and clayey, and often sank ankle deep. After an examination of the curious clayey deposit, he put several handfuls into his pockets, mounted his horse, and returned across the mountains to his home in Columbus. There handed the contents of his pockets to an assayer, who after an analysis, proof the curious clayey deposit, he put several handfuls into his pockets, mounted his horse, and returned across the mountains to his home in Columbus. There he handed the contents of his pockets to an assayer, who, after an analysis, pronounced it the richest sample of borax he had ever seen. This fact at once created great excitement, and no little expense attended the necessary claiming, etc., on the part of the fortunate discoverer. It soon proved to be an enormous lagoon or deposit of crude borax, two and a half miles wide, and five or six in length. It was more than one man could properly manage, so a brother was sent for, and the two (now widely known as the Smith Brothers, of Nevada and New York) worked with a will, sparing neither time nor money until the whole deposit was their properly, and its wealth being developed. They at once obtained boilers, tanks, crystallizers, etc., from Chicago, and commenced operations. The result is that, in the course of three or four years, the brothers have perfected an immense establishment, and are producing an enormous quantity of a chemically pure article of borax, which stands first, and is in demand in every household, to whom it is supplied by grocers and druggists throughout the country. So important has this new industry become that the eminent house of W. T. Coleman & Co., New York and San Francisco, some time ago became the sole agents for the article, and they are now pushing its sale in all parts of the world. We are indebted to them for the foregoing particulars.

The most wonderful part of our story is that the vast deposit of borax in Teel's Marsh reproduces itself every two or three years, so that the supply will continue inexhaustible. This fact, and the additional one that the article has been put at the lowest figures, must prove a great benefit and blessing to the people, for borax has become indispensable for many purposes, being much used in the arts, the household, and as a hygienic remedy. Indeed, the uses of borax are so varied, and its proper

#### RIVER-TRAINING OF THE INDUS AT SHAH JAMAL.

By G. W. Vyse, Assoc. Inst. C. E.

Few rivers have more variable floods, shifting streams, and less stable channels than the Indus throughout the greater part of its course. There is no single reach of its main stream which is straight for I,000 feet. If its banks do not curve and twist every 200 or 300 feet, its stream will rebound from left bank to right in a most persistent manner; and what is very noteworthy, when the river is thus acting, is the variable way in which it discards the silt on the side it regurgitates, erosion and retrogression of lead going on where it impinges. The bays, so common along the soft shores of the Indus, are due to the action of whirlpools, which scour the bed and change the course of the river far more than do the high floods. To attempt to check the erosive action of these whirlpools by throwing masses of brushwood, or bags of stone, or weeds into the than do the high floods. To attempt to check the erosive action of these whirlpools by throwing masses of brushwood, or bags of stone, or weeds into the middle of them is utterly useless, indeed such means tend only to increase the scour and to add to the power of the whirl. These whirlpools can, however, be stopped or checked by turning the current some distance above their influence. In some cases 1/2 mile up stream is not too far up to commence operations, and on one occasion it was found necessary to work 1 mile of running water before an unusually powerful whirlpool could be checked.

For some years past erosion has been taking place to a considerable extent in the banks of the Indus at Shah Jamal, where the sand is of a very friable nature. Various means have from time to time been adopted to keep back the floods from inundating the surrounding districts; such as throwing up massive bunds and embankments some distance back from the sides of the river. These have answered their purpose fairly enough until the Indus approached them, when the erosion setting in made short work of the most massive of earthworks, and

answered their purpose fairly enough until the Indus approached them, when the erosion setting in made short work of the most massive of earthworks, and swept out everything else that opposed its course. At Shah Jamal several lines of these bunds have been run up, one behind another, for many years past, only to be carried away by the succeeding season's flood. At one point in particular a number of bunds were thrown up to check the Indus from pursuing a westerly direction, and from proceeding towards the head of the Dhundi Canal. The end of a great embankment constructed in 1864 was more than 4 miles east of the present Dhundi Canal head. In 1870 an addition became necessary, owing to the erosion extending ½ mile in that direction, at the end; this was followed by a further addition of embankment directly behind it in 1871. The 1872 bund was run up I mile behind that of 1871, and almost parallel to it, until it joined the Dhundi Canal head, which was then 3 miles from its present mouth, and a

oop line followed this in 1874, which was eaten through in the following year. This state of things at last attracted serious attention, and after many experiments with various kinds of floating breakwaters, spurs, and barrier works, to check the velocity, and thereby cause silt and deposit, orders were given to defend a sharp bend in the river, opposite Tiger Island, above the point where the principal erosion was taking place, by means of "Brownlow weeds" thrown out to meet the main current and to act as spurs. After the floods were over, a narrow, shallow creek was discovered, newly formed from Tiger Island, connecting the two ends of the horse-shoe curve of the river, wherein the principal erosion was taking place, and it was determined, if possible, to divert the main stream of the Indus down this channel. The creek ran dry early in December, but by clearing out the accumulated silt at the head, the channel was reopened, and by means of a little cutting, and by throwing out a strong 500-fcot catchbarrier across the main stream below the mouth of the creek, the volume of water passing through it increased to 2,200 cubic feet per second. Subsequently a freshet came down the river, and a vast quantity of water being forced to take this course, the channel was increased from to to 80 feet wide in a single week, and before the end of March it had 'increased to a minimum width of 400 feet, with a discharge of 7,000 cubic feet per second. Acroes the low sandy banks at the west side of the river barriers were constructed of piles driven into the sand, and strongly interlaced with let bru-hwood, with cross-bars, supports, and counter-supports to strengthen them. To the end of these barriers, floating breakwaters composed of stacks of jungle were thrown out to check the stream and to help in causing deposit. Some off these breakwaters were 4,000 feet long. They consisted of a main cable, measuring 1 foot in circumference, which was attached to supports from the shore at every 100 feet or so. Where the shore was not

#### THE OUTPUT AND CONDITION OF THE LAKE SUPERIOR IRON MINES.

From the Marquette Mining Journal of various dates we take the following notes regarding the mines of the Lake Superior region, also a statement showing the shipments for the season up to the 21st of November in tons of 2,240 lbs. We have added, for the sake of comparison, the shipments for the year

			IRON	ORE.		
	Name of Mine.	1876.	1877.	Name of Mine.	1876.	1877.
3	Cleveland	145,661	126,555	Bessemer	4,779	10,645
	Republic		165,849	Humboldt	3,333	16,940
ľ	Lake Superior		119,037	Excelsior	2,857	
3	Jackson	78,879	63,289	Wheeler	2,022	
l	Michigamme		26,926	Erie	1,058	
1	Champion	66,002	70,833	Nelson & Curry	732	
	New York	59,230	56,649	Grand Central	456	
	Saginaw		43,230	Foster	320	
	Rolling Mill	53,265	28,837	Smith	225	8,432
	Barnum		37,505	Mitchell		8,807
	Winthrop	27,236	10,799	South Jackson		8,183
	Lake Angeline	22,539	19,111	Breen		5,080
-	Salisbury	20,315	37,650	Vulcan		2,433
)	Spurr Mountain	20,276	22,768	Marquette		1,658
)	Edwards	19,330	8,782	R. P. Traverse Quartz		1,281
7	McComber	17,275	19,970	Carp River Quartz		671
9	Palmer	15,324	20,208	Stewart		934
9	Keystone	7,715	14,496	Goodrich		503
	Cambria	6,329	10,082			
	Shenango		00	Total	068,233	063.252

Pig Iron.—The shipments of this article were as under:

Pioneer Furnace	2,467	Morgan Furnace	663
Carp River Furnace	2,911	_	
Rolling Mill Furnace	6,856	Totaltons 1:	2,897

The tables of shipments given above do not include the ore sent by rail and to local furnaces, which will be added at the close of the season. The decreased production of the mines, as compared with 1876, will be about equal to the difference in the quantity of ore smelted in the district, though the shipments by rail have not been nearly as large as last year. The falling off will not be much, if any, more than 5,000 tons.

The Cleveland Mine.—The diamond drill at work in the bot'om of the School

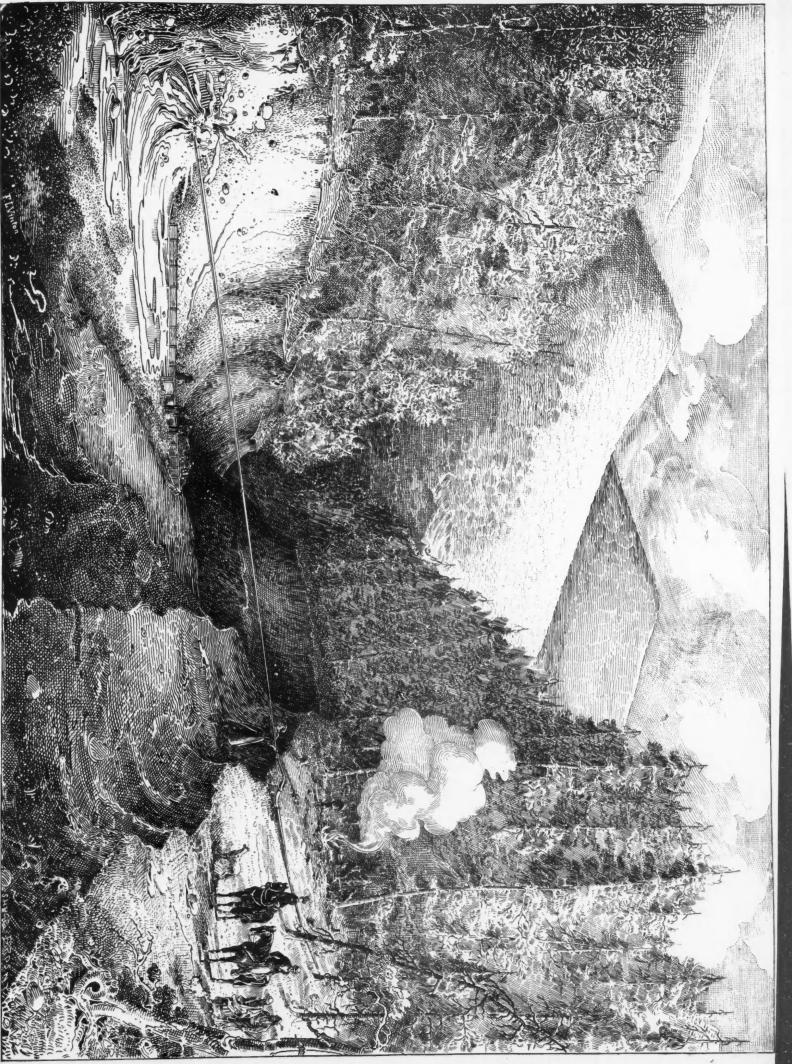
The Cleveland Mine.—The diamond drill at work in the bot'om of the School House mine, 400 feet from the surface, on the incline or dip of the vein, and 117 feet vertically, after passing through 29 feet of rock, struck a deposit of very pure ore, through which it passed 55 feet into mixed ore and rock. This mine was considered practically exhausted, the hanging and foot walls having approached so closely to each other in the bottom as to give the vein or deposit more the appearance of a pocket than anything else. It would now appear, however, that there is a break or shove in the vein, since the drill certainly reveals the existence of a very large body of ore of the same quality as that formerly taken from the mine, beyond the apparent junction of the foot and hanging walls.

ing walls.

The R-public Mine.—The season's output of this mine amounts to 165,849 tons. The Republic Mine.—The season's output of this mine amounts to 165, 849 tons. While mining this large product the mine has been prepared for work on a lower level, and its productive capacity thus materially enlarged. Ore will be raised from the new levels during the winter, and we expect to see stock piles in the spring that will eclipse anything heretofore accomplished, even at this most wonderful of all the known iron mines of the world.

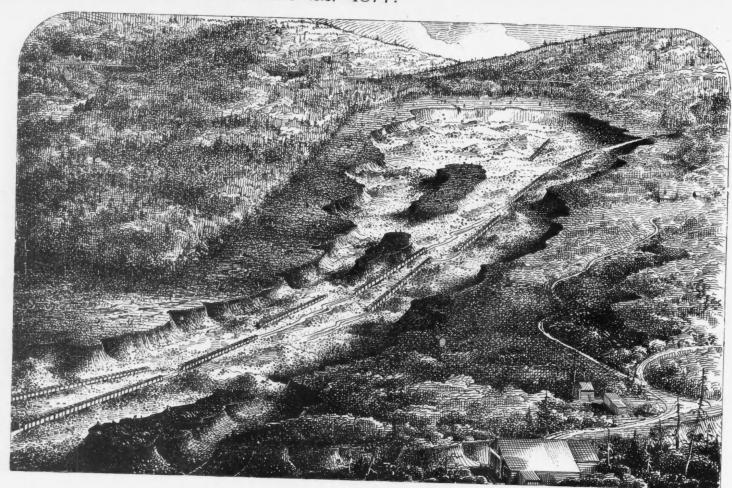
The Lake Superior Mine.—Late developments at this mine have demonstrated that the prospect for continued large yields of ore are better now than for many years. In the main open workings of the mine they are constantly

Abstract of paper in the Professional Papers on Indian Engineering, from the Minutes and Proceedings of the Institution of Civil Engineers, of London, edited by James Forrest, Secretary.



FULLER PLACER MINING





HUMBUG GULCH.



DRY & AMERICAN GULCHES.

sinking and taking out large quantities of first-class ore, the vein keeping its uniform width down to the lowest level. At the western wall of the open workings the vein becomes very narrow, and at one time must have looked as though it would run out. But as drifting was continued westward along the vein, it began to widen again and to dip to the south, and now work is being carried on in one of the largest solid bodies of ore ever developed in the county. The foot wall has been followed to the north and worked westward several hundred feet, and drifting began south, through solid ore, in order to ascertain the width and extent of the deposit. The deposit, from all appearances, seems like an immense body of ore, formed by the junction of the veins running from the east and west, and meeting at this place, forming a solid basin of rich ore of an extent which cannot be known until the southern wall rock is reached. The bodies of ore lying to the east and west of the narrow strip on the west of the open pit, are in the shape of two immense pumpkin seeds, meeting at the points. Entering and going through the tunnel leading from the open pit, the wall rock on the south is noticed to shoot off in a southerly direction, and at every step westward the vein widens rapidly. Then an immense chamber sixty-five feet in diameter is reached, with miners working south and west in the solid, unbroken body of ore, with the rock visible only on the north, which forms the foot-wall Leading from this is another tunnel, which terminates in a second chamber, double the size of the first one, it being about 125 feet from east to west, and 65 feet from north to south, and about twenty feet high. Here the foot-wall is also visible on the north, and work is being pushed in three directions through the sinking and taking out large quantities of first-class ore, the vein keeping its uniform width down to the lowest level. At the western wall of the open workvisible on the north, and work is being pushed in three directions through the solid ore. The both chambers are being worked from the foot-wall southward to ascertain the width of the vein, but in neither case gotten through the ore. It penetrated 65 feet directly across the vein in both places, and it would not be surprising if found to be one hundred feet wide. The bottom of these workings surprising if found to be one hundred feet wide. The bottom of these workings is 175 feet below the surface. Thirty feet above these are several other large chambers, also in the solid ore. These vast deposits of ore seem to dip from the foot-wall in the farther chamber, towards the south and east, and their full extent can be known only after the exact width from north to south is ascertained; but enough is known to assure a continued large yield of ore for a great many years. It will be seen from this that the Lake Superior mine is tolerably well fixed to turn out ore in the future. All in the mine seems easy of access, and is economically mined.

The Michigamme Mining Company has resumed operations in its coetars.

is economically mined.

The Michigamme Mining Company has resumed operations in its eastern opening, known as No. 1. The deposit, while not over 80 or 90 feet in length, is rapidly widening, or jutting into the hanging wall, and looks as if it might make an extensive opening. This pit has been idle since the fall of 1874. The company commences stocking for next year's shipments with a start of 30,000 tons already broke. If they do not ship any ore next year, they will probably reach that 200,000 tons in 1879, as predicted.

The Champion Mine.—The new machinery for this mine is on the ground, and will probably be in operation in the course of a month. This machinery is the largest of any in the district, requiring a train of thirty-two cars and two engines to transport it from this city to its destination. The shipments of the Champion the present year will exceed 70,000 gross tons.

Champion the present year will exceed 70,000 gross tons.

The Barnum Mine.—At the shaft on the Barnum property, just east of the mine, they have struck the ledge at a depth of 65 feet from the surface. The diamond drill that has been at work at the Excelsior mine has been placed in position over the shaft, and the company will soon know what the prospects

are for ore.

The Winthrop Mine.—At the Winthrop nine the new contractors are jubilant over the favorable outlook for a largely increased product the coming year. The machinery has been put in perfect order, and everything about the mine put in the best possible shape for economical work, and we learn that a force of nine men in one pit are mining and sending to the surface about 100 tons daily. What was supposed to be a "horse" of rock in one part of the mine, and which had been left standing, is found to be simply a thin shell with a large body of ore behind it. The contractors expect to have the mine in shape by spring, for a production of at least 300 tons per day.

The Spurr Mine.—Explorations of an important character have lately been carried on at the Spurr mine, some of which have produced very satisfactory results. The cross-cut driven north from the western end of the mine has now reached about 100 feet from the line of the vein, passing through a large body

results. The cross-cut driven north from the western end of the mine has now reached about 100 feet from the line of the vein, passing through a large body of diorite, and is now in ore carrying a large portion of sulphate of iron. It will be remembered that the Spurr vein is abruptly cut off by an immense heave, or rock crossing, about 700 feet from the section line dividing the Spurr and Stewart properties; this heave is composed mainly of diorite, and crosses the vein in an oblique direction, the vein running almost east and west. The crossing extends from the northeast to the southwest, the dip of the heave itself being to the northwest. The magnetic attractions on the surface show a displacement of the vein of about 100 feet, and the underground workings at a depth of 150 feet by the cross-cut above mentioned, verify the accuracy of the magnetic observations on the surface. The presence of sulphate of iron at a point so far north from the vein is indicative of the cross-cut being at or near a large deposit of pure ore. If such should be the case, it will give to the Spurr Company in the neighborhood of 600 feet more of available working ground.

The McComber Mine.—At this mine about 60 men are employed, the average daily output being about 100 tons. No. 4 is known as the manganese pit. The manganese ores found at this mine, and of which four or five thousand tons have been shipped, bring an advance of \$1.25 per ton over the other hematite ores, and is much sought after by furnacemen. It is believed that 10,000 tons of this ore can be mined next year. The openings are gradually being prepared

ores, and is much sought after by furnacemen. It is believed that 10,000 tons of this ore can be mined next year. The openings are gradually being prepared for underground work.

The Cambria Mine.—The new shaft being sunk on the Cambria has now reached a depth of nearly 16 feet. A force of about a dozen men are steadily at work sinking, it being the intention of the company to reach a depth of about

45 feet. The shaft, so far as sunk, passes through a body of clean ore.

The Bessemer Mine.—Work on a new shaft has been commenced at this mine, where a force of about 20 men will be kept employed during the winter. This shaft will be sunk to a depth of 50 feet, and from the bottom a number of drifts will be driven in various directions in order to determine as nearly as possible

the extent of the deposit, with a view to economical work in the future.

The Smith Mine.—At this mine about 35 men are employed, and will probably be kept at work all winter. The mine is, in excellent condition, and the show of ore much better than ever before.

that of the drift. The ore has changed somewhat in appearance from that taken from the shaft last summer, the latter being a fine-grained ore of a steely nature, while that taken from the drift is a soft black magnetic, amd much easier to mine. The mining force of this company is being increased slowly, men being

added as fast as the work is extended.

The Burt Mine.—They are building a new warehouse at the Burt mine 24 by 60 feet. They are also completing their new ore dock, which, when finished, will

The Burt Mine.—They are offinding a new warehouse at the Burt mine 2 by 60 feet. They are also completing their new ore dock, which, when finished, will be one of the finest and largest in the county.

The Menominee Iron Region.—The Menominee Herald says: "An analysis of the recent discovery of a vein of magnetic ore on Section 32, two miles west of the main workings, gives 64 per cent. of iron. It is strongly magnetic in bulk, attracting a needle 90°, but in small quantities has no perceptible influence upon it. The vein was much broken up on the surface, but at a depth of five feet was five feet wide. The recent rains have interfered with the mining operations somewhat, causing the banks bounding the strippings to give way, but the delay caused was only temporary. The company now has in its employ fifteen miners and three teams. The owners of the Ingalls property are making arrangements to give it a thorough exploration during the coming winter. It embraces the north half of the northwest quarter of section 9, town 39, range 29; and the south half of the northwest quarter of section 8, same town and range. The outcrop has been found on the first description, which is just half a mile west of the Vulcan mine. The outcrop is first developed in the face of a hill, and consists of a bed of black-looking ore some 50 feet wide, a surface specimen of which analyzed 58 per cent. The continuation of this hill to the westward is disturbed by a swamp, through which the ledge is known to pass. In a hog-back which rises from the swamp two other kinds of ore have been discovered, which are very promising. The Menominee Mining Company has contracted for 11,000 tons of ore to go

South over the railroad this winter.

Kimberly Iron Company.—A new corporation to be known by this name is being formed, based on some 10,300 acres of iron lands purchased in 1872, by George C. Reis, trustee. The company's lands embrace choice selections in Marquette and Menominee counties, and are believed to be quite valuable.

#### MISCELLANEOUS IRON NOTES.

The New Jersey Iron Mines. - The Iron Era, of recent date, furnishes the folwing notes regarding the iron mines in that vicinity:
"One of Wilson's patent furnaces is being erected at the Rockaway rolling

mills, and another at the same place is in contemplation. It is said that a strong company has been formed, and that work will begin at once.

"All work is now suspended at the Ogden Mine, and all that remains of that

once thriving mining community is about 100 empty houses.

"The Carbon Iron Company has been reorganized, and we may hope to hear of their resuming business soon in this section.

"Ten additional men were put to work at Hibernia by the North Jersey Iron Company on the 3d inst.

"About 160 tons of ore per day are being shipped from Hibernia by the Andover Iron Company.

There is again some talk about the rolling mills at Port Oram.

"There is again some talk about the rolling mills at Port Oram."

Hanqing Rock Iron Region.—The following are from Greenup Independent:

'That portion of the Hanging Rock iron region centering about Ironton numbers nine charcoal furnaces and three stacks running on stone coal. Of these, the Center and Grant are now out of blast. The Vesuvius and Ætna furnaces are not numbered among the living furnaces any longer, although 130 tons of iron ore are being dug by them for the Alice stone coal furnace at \$1.25 per ton for digging, and, according to distance, at 75 cents to \$1 for hauling. The Alice furnace, running on native ore and coke, is averaging 53 tons of very good foundry iron. The Belfont furnace, using 5 buggies of coke to 1 of raw coal, and running on Missouri ore, mill cinder and native ore, makes 47 tons per day. Her hot blast indicates 860° and her blast gauge two pounds. The new Hiram Campbell furnace is putting up her Whitwell oven shells, which look like small giants alongside of the main stack. Work on the furnace inwall has been begun. The stock house is to be 66 by 100 feet, the casting house 49 by 71 feet, gun. The stock house is to be 66 by 100 feet, the easting house 49 by 71 feet, and the smoke stack 107 feet high. Of the mills, the Lawrence and Belfont are and the smoke stack 107 feet high. Of the mills, the Lawrence and Belfont are running, as well as the nail department of the latter. At the tunnel coal mines, only those miners are at present at work who are employed at the Belfont and Lawrence banks. The price for digging is 50 cents per ton for screened coal. The Olive, Howard, Buckhorn, and Vernon furnaces continue doing well. Their irons are hauled to Center Station. The iron of the Pine Grove furnace, making from 16 to 17 tons, is taken to Hanging Rock, and that of the Ohio to the Union landing. The Lawrence furnace, now in the hands of an assignee, will not run much longer. She is making coal blast iron, and is doing tolerably well. She is situated almost directly on the railroad. The Norton Rolling Mill and Nail Works only are in operation, with about two months' stock of pig iron on hand. It is now believed that the improvements of the Ashland and Norton furnaces will not mature before the 1st of January. The Princes furnace conand Nai was only are no perator, which about we most set of pig from on hand. It is now believed that the improvements of the Ashland and Norton furnaces will not mature before the 1st of January. The Princess furnace continues making an excellent grade of iron, and is also giving satisfaction as to quantity. At Coalton, only ore is being received, of which some 7,000 tons have now accumulated. The price for good native ore, dug and delivered, which was paid here up to 30th September, was \$1.75 per ton, store goods, but was, we unders: and, to be raised to \$2 this month. One hundred and sixty coal miners and other necessary laborers are now steadily at work at the Rush mines, receiving 45 cents per ton of screened coal. A late decision of the managers of this company, ordering the loading of all their 106 coal barges, whose aggregate capacity exceeds 1,000,000 bushels, will continue to keep these men employed for several months. At the Star furnace department, which represents the ore and coal supplies of the Norton works, iron ore is at present coming in at an average rate of 700 tons per month, and is paid for at \$2.25 per ton in store goods. There are now on hand at this place from 9,000 to 10,000 tons of good ore."

The Connecticut Iron Mines.—Of the eight furnaces in Connecticut and New York in which Senator Barnum is largely interested, two at East Canaan and one

The Connecticut from Antes.—Of the eight intrinces in Connecticut and New York in which Senator Barnum is largely interested, two at East Canaan and one each at Sharon and Millerton are in blast, one at Lime Rock just gone out of blast, and one at Huntsville just gone into blast. The production is about 3,000 tons per annum to each furnace, and the product goes to the Middle and West-

be kept at work all winter. The mine is in excellent condition, and the show of ore much better than ever before.

The Mitchell Mine.—This Mine, formerly the Shenango, is idle, and has been allowed to fill with water. This is not owing to any lack of quantity or quality of the ore, but to the depressed state of the market, and the disinclination of the company to mine the ore faster than it can be sold. The operations will most probably be resumed early in the spring.

The Stewart Mine.—At this mine a drift is being driven east from No. I shaft towards the Spurr, in good, clean black ore, the width of the vein being about

light rail and merchant iron, with orders for all they can manufacture for some time. The Boane Iron Company are making iron rails for the Memphis and Charleston Railroad, on a contract for five hundred tons.

The Antietam Iron Works.—The Hagerstown Mail says that the Antietam iron works would have been started, but for the suspension of navigation on the canal. The damage to the works by the flood was about \$5,000.

The Glendon Iron Company, Easton, has at present more orders on hand than they can fill with their present number of furnaces in blast, and are making arrangements to text up all their furnaces.

they can fill with their present number of farmaces in blast, and are making arrangements to start up all their furnaces.

The Curbon Iron Company has been reorganized at Perryville. Under the new arrangement all the stock of the old company, nearly \$500,000, is wiped out, the holders of the second mortgage having bought the property at sheriff's salc.

#### MINING NEWS.

### Staff Correspondence of the Engineering and Mining Journal.

Boulder County .- A recent test of eight tons of ore from the Centennial lode owed 21/2 ounces per ton. The company propose to put up a mill immedi-

The Keystone and Mountain Lion mines at Magnolia are working together about 35 men, and are producing well. On the Magnolia vein six claims are be-

The Keystone and aroundard floor than about 35 men, and are producing well. On the Magnolia vein six claims are being worked with success.

The S. B. lode, recently cut in the Shotwell tunnel, is turning out quite a quantity of very fine free gold ore, and gives promise of doing better as the development progresses. The tunnel will probably be pushed ahead, as the slope into which it runs is cut by several large veins of known value.

The John Jay has been provided with a new shaft house and hoisting engines.

A strike of telluride ore was made in the Aitcheson tunnel 300 feet in on the

A strike of telluride ore was made in the Aitcheson tunnel 300 feet in on the tenth. As yet it is nothing enormous, but simply encouraging.

The difficulties over the title to the Smuggler mine have at last culminated in a temporary stoppage of operations. The mine is in especially fine condition, shows an abundance of both high and low grade ore (the latter being concentrated), and is developed to that point where a continuous production without robbing the stopes is possible. It is thought that the present difficulties will be settled in a short time.

The Black-Hawk Tunnel Company have elected a new set of officers and trustees, and have decided to push work on their enterprise night and day. The tunnel enters Winnebago Hill from Chase gulch, and will cut almost all the lodes of that slope. It is now 140 feet in length.

Prof. Hill is now talking very seriously of moving his great establishment to

Denver in the spring. The works are now shipping from \$150,000 to \$200,000 in fine bullion monthly. Its capacity was enlarged during the fall to 60 tons

daily.

The Bobtail Company are working steam drills in their levels, and are finding them satisfactory and advantageous. They had previously worked them in sinking the main shaft.

The Monmouth-Kansas mine shipped mill gold during November to the value of \$8,800, in addition to a fair quantity of high grade smelting ore.

The Central City tunnel is advancing again with a steam drill.

The necessary machinery for the reopening of the Gilpin & Coaley lodes is being set up. One by one all the old mines are coming to the surface after the disastrous and long-continued years of idleness, and, better still, are paying well.

The production of the Gilpin County mines for the month of November was \$223,730, of which amount \$102,250 was in mill gold, \$106,500 in fine gold and silver bars, and \$15,000 in ore shipped out of the country.

The shaft on the Comstock is now 360 feet deep. The mine is yielding about

So tons weekly of good kill ore.

The Bobtail keeps 95 stamps in constant operation. The main shaft has recently been connected with the vein 280 feet below the tunnel level.

Clear Creek County Courier.—The Red Elephant district is producing about \$12,000 weekly, nearly all of which is coming from two claims on the Boulder West Mine.

A drift westward is now being driven from the Marshall Tunnel on the Colo-Tado Central, which will explore that mine 200 feet below its deepest workings.

The Clear Creek mill is running at full capacity in both its concentrating and leaching departments. The capacity of the latter has lately been increased by the addition of two new Bruckner cylinders. Both departments are working

by the addition of two new Bluckner cylinders. Both departments are working very satisfactorily.

The numerous mines in Virginia cañon are looking very well. Pre-eminent are the Specie Payment, which continues a steady yield of good ore, the Trio, Columbia, Crystal, Wabash, Dubuque, and Bald Eagle.

Operations on the Dunkirk, though as yet not paying, are pushed ahead with commendable perseverance. The mine is doubtless the east extension of the Dives, and shows all the characteristics of that famous lode. The shaft is 400 feet deep, and is expected shortly to cut the eastern extension of the noted ore body, which has made the reputation of the claims on the same vein to the

westward. It is under good management.

San Juan.—Some very fine specimens of tellurium ore have recently come to Denver for examination from the vicinity of Parrott City, on the Rio La

Dow & Waters's leaching works on Cement Creek will be in operation early in the Spring. They will have a capacity of 12 tons daily. The cost of erection, including transportation, of machinery, road grading, supplementary buildings, etc., will be over \$100,000.

crockes's works, at Lake City, have shut down for the winter. The ore supply in Southwestern Colorado depends so much on animal transportation, and the districts are as yet so poorly supplied with good trails and wagon roads, that it is not conomical as yet to reducers to attempt reduction during the winter months. The production of ore in a large number of mines will, however, continue throughout the season, and in the spring there will be a large stock on land.

Messrs. Melville & Sommervill, of Silverton, who were so unfortunate as to be led into erecting a Walker lightning amalgamator at their fine works this year, are now tearing out the worthless appliances of that process, and w'll replace it with the Hunt, Douglas & Stewart system early in the spring. These gentlemen (Melville & Co.), though they made a disastrous failure this year, are not discouraged.

A company has been formed to build a railroad from a point on the upper Ani-A company has been formed to build a railroad from a point on the upper Animas River, near the Highland Mary mines, to Animas City, where extensive coal deposits exist. The object is to bring the fuel to the mines for transportation purposes. It will be 60 miles long.

A new strike of tellureted ore was recently made in the Hotchkiss Mine, near

Lake City. This mine has been barren for some time past.

The Ocean Wave furnaces are again at work, the iron water-jacket being reaced by a brick-walled crucible.

Summit County.—At Montezuma, the Republic, Champion, Cashier, Chatauqua,

and Sts. John Mines will be worked during the winter. The Lisapo Sampling Mill is to be fitted up to handle a large quantity of ore. Across the divide, in Hall's Gulch, the Whale is working satisfactorily, and producing well. There are again reports that the Hall Valley Company will attempt smelting in the spring. In the placer districts much work, preparatory to next season's opera-

spring. In the placer districts much work, preparatory to next season's operations, is going on.

Coal Statistics.—There is another miners' strike at the Boulder Valley bank.

Cause, as once before, non-payment of wages. It is confidently stated that the trouble will be met shortly. Three of the Golden collieries, Hall & Jones, Colorado Limited, and Nichols have reopened, and expect to be producing largely

The Coal Creek Mines (Southern Colorado) are producing about 300 tons ally. For the week ending December 8, the yield was 1,575 tons.

The Rob Roy and Star Mines, at Erie, are doing the bulk of the Northern

al trade at present:

We are expecting to be able to report the production of the Colorado collier-es hereafter weekly.

#### NEW MEXICO BULLION PRODUCT.

The Mesilla Independent reports the yield of precious metals in New Mexico for the year ending June 30, 1877, as follows:

Grant County	Gold. \$36,346	Silver. \$338,421	Total.
Colfax County	20,000	10,000	30,000
	\$176,346	\$348,421	\$524,766

During the past year the production in the Moreno Valley is reported to have amounted to \$250,000, while the silver production in Grant County will probably exceed \$400,000. The yield of the Territory for the year just ending may therefore be assumed to be nearly \$700,000. If to this figure is added the value of copper sold at market rates in Baltimore, the metallic output will amount to about \$1,000,000. These figures show considerable advance in the mining industry of New Mexico.

#### NOTES.

Canadian Geographical Society.—A meeting of gentlemen was held in the Parliament Library, at Quebec, on December 14, to found and establish a Canadian Geographical Society. The objects proposed by this movement are to gather information useful to the development of the whole Dominion.

THE BRITISH COLUMBIA GOLD EXCITEMENT.—SAN FRANCISCO, December 20, 1877.—A dispatch from Victoria says the excitement over the quartz discoveries in Cariboo continues unabated. Reports of new discoveries are constantly coming in. Business throughout the province has received a great impetus, and extensive city improvements are projected.

tensive city improvements are projected.

HEAVY COAL FAILURES.—Kelley, Morley & Co., coal dealers of Chicago, Ill., have failed with liabilities estimated at \$300,000 while the assets, it is believed, will not realize over 50 cents on the dollar. It is claimed that Messrs. Kelley, Morley & Co. have, all the past season, been selling coal at from 50 cents to 75 cents below the market price, and this, together with the continued warm weather and the lack of demand for coal, has had the effect to render it impossible for the firm to meet their commercial paper. They have now in store over 25,000 tons of

CINCINNATI, OHIO, DECEMBER 19.—A special dispatch from Henry, Ill. L. B. McFadden & Co., large operators in coal mines, failed yesterday. Ilabilities are stated to be \$370,000.

L. B. McFadden & Co., large operators in coal mines, failed yesterday. Their liabilities are stated to be \$370,000.

The Mineral Wealth on the Seattle & Walla Walla Railroad.—The Seattle Dispatch says of the mineral resources on the line of this road: "The mineral belt traversed by this road is a most valuable one. The iron ores are of the qualities which unite in the best of iron, the coal, which is conveniently located, is the kind used in the reduction of these ores, and both are found in inexhaustible quantities convenient to one of the best ocean harbors in the world. The iron will eventually be manufactured in Seattle to supply the trade of the Pacific coast and islands, and a large population will be employed in the manufactories; the coal will drive from the market that now shipped to this coast from the East, and from foreign countries."

A Large Order for the "Baldwin" Locomotives from Russia.—The Baldwin Locomotive Works have received an order from Russia to proceed at once to build forty of the largest-sized first-class freight engines of the five-foot gauge, to be completed during February and March, 1878. In a letter received by the firm from Mr. Parry, a few days ago, he stated that the Russian government has absorbed nearly all the railway plant for war purposes, and that it is being rapidly used up and destroyed in that ruinous service. Meanwhile the largest crop of wheat ever raised in Southern Russia and Bulgaria is rotting in the bins for need of transportation. This wheat, which usually finds an outlet from the Black Sea ports, will have to be transported by rail to the Baltic ports, and about 300 new engines will be required at once. A large proportion of these will, however, be built in Europe. The value of the 40 engines to be built at the Baldwin Works will be over half a million dollars. About eleven hundred men are now employed in the works, but this order will necessitate a large addition to the force, and from 700 to \$800 additional men will be taken on as the work proceeds.

#### ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

This department is opened for the benefit of miners, prospectors, and others

Assays determining the actual composition and value of ores will be made at the following rates:

Assay	y for	Gold	\$2 00	Assay for Lead	\$1	50
	64	Gold and silver	2 50	" Zinc Control Assays	3	00
	6.6	Copper	2 00	Zinc Analyses	5	00

Where reply by letter is desired, an additional charge of 50 cents should be

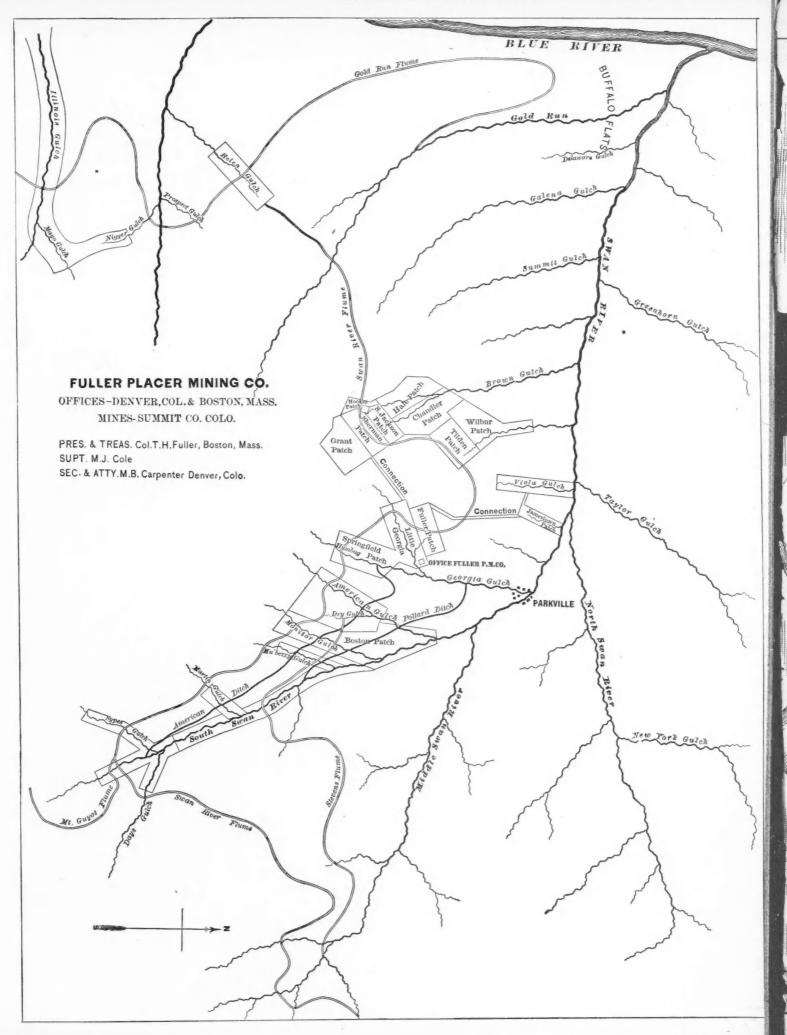
The amount should invariance, and the should invariance, and always be prepaid.

Communications, samples, etc., to be addressed to Western Office,

Engineering and Mining Journal,

Denver, Colorado. The amount should invariably accompany the order, and expressage or postage

Engineering and Mining Journal, 27 Park Place, New York. (P. O. Box 4404.)



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FULLER PLACER MINI CO., COLOR



CO., COLORADO, No. 2.

SOUTH SWAN VALLEY, SHOWING SWAN RIVER FLUME (13.75 MILES LONG).

### STATISTICS OF COAL PRODUCTION.

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

Comparative Statement for the week ending Dec. 15, and years from Jan 18t.

	18	77.	1876.		
Tons of 2,240 lb.	Week.	Year.	Week.	Year.	
Wyoming Region.					
D. & H. Canal Co	59,666	1,801,556	35,663	1,897,906	
D L. & W. RR. Co	69,650	1,924,448	02,031	1,912,036	
Penn. Coal Co	24.572	8,004,470	23,416	1,056,266	
L. V. RR. Co	16,9.0		32,010	927,189	
F & N. Y. RR. Co	350		1,009	25,483	
C. RR. of N. J	42,057	1,297,382	33,709	1,337,451	
Penn. Canal Co		340,231		407,522	
Lablah Danie	2'3,205	7,279,877	187,928	7,561,693	
L. V. RR. Co	67.182	3,224,257	62.442	2,747,133	
C. RR. of N. J	38,583	1,465,994	27,505		
D. H. & W. B. RR	1,280	34,473	848		
Schuylkill Region,	107,045	4,724,724	91,795	4,142,557	
P. & R. RR. Co	147-773	6,571,593	00 140	4,796,071	
Shamokin & Lykens Val.	12,107		13,52/		
	159,883	7,262,935	112,667	5,721,611	
Sul. & Erie RR. Co	654	20,377	247	30,43	
Total	480, 84	19,287,913	392,637	17,456,29	
Increase	88,147	1,831,616			

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

Recipits and shipments of coal at Chicago, Ill., for the week ending Dec. 15, and year from January 1:

Week. Tons. ents..... 23.447 1,693,710

period in 1876.

Perth Amboy business:

Received for the week 27,306

Shipp of for the week 31,457

On hand bec. 15. 93,387

Shapments of coul at Pictou, N.S., for the week ending

Lec. 15 and year from January 1:

Week. Year

To Canada
" United States.
" Other Provinces.
" West Indies... 3 813

Receipts of Coal at Boston, for the week ending Dec. 14

Tons of 2,240 lb.	18	77-	1876.	
10118 01 2,240 10.	Week.	Year.	Week.	Year.
From				
Alexandria and Georgetown	1,626	86,614	1,710	60,891
Philadelphia	8,642		10,132	608,216
Baltimore	3,050		1,884	146,481
Other places	12,171	262,360	7,408	285,021
Great Britain	1,944	20,278		5,734
Nova Scotia		41.077	****	24,9 /1
Total	27,433	1,244.530	21.134	1,131,935

toal Cleared on the Canals of the State of New York from ec. 1 to close of navigation and years since the opening of

Manual and Dr	18	77-	1876.	
Tons of 2,000 lb.	Week.	Year.	Week.	Year.
Anthracite	23,869 879		8,701 772	773,974
Total amount cleared	24,748	1 216,340	9,473	1,062,087
Of the above there was cleared at tidewater ports, viz., New York. Abany, West Troy, and Waterford. Cleared at internal ports	19,959	830,359 385,931	7,241 2,232	473,527 568,660

eek ending Dec. 15 was as follows:

week chang bec. 15 was as follows.		
Tons of 2,000 lb., except where otherv		
Cumberland Region, Md Week	. Tons.	Year, Tons
Tons of 2,240 lb Barclay Region, Pa.	23,386	1,510,87
Barclay RR. tons of 2,240 lb	7,506	321,92
Huntingdon and Broad Top RR	2,9 18	134,07
*East Broad Top	1,223	51,41
*Snow Shoe	1,116	41,53
*Tyrone and Clearfield	26,308	1,294,83
*Pennsylvania RR	4,052	175,64
*West Penn. RR	4,082	179,43
*Southwest Penn. RR	685	37:45
*Penn & Westmoreland gas coal, Pa. RR	23,505	732,78
*Pennsylvania RR*  * For the week ending Dec 14.	7,017	361,59

For the week chaing Dec 14.		_
The Production of Coke for the v	veek ending	Dec. 14
Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	824	55,925
Southwest Penn. RR	14,539	548.783
Penn & Westmoreland Region, Penn. RR	1,147	62,672
Pittsburg, Penn. RR	. 1.803	104.706

Total. .....

#### COAL TRADE REVIEW.

NEW YORK, Friday Evening, Dec. 21, 1877. Anthracite.

The combination talk and the advanced prices have brought business to a standstill, although shipments on old orders continue to be made quite freely, the open season enabling the companies to ship to ports that are usually closed by this time in the year.

On Tuesday a meeting was held at the Coal and Iron Exchange in this city for he purpose of forming a coal combination. The several interests were represented by Messrs. Hoyt, Sloan, Gowen, Dickson, Clark, Scott, Cassatt, Sayre, Lathrop, and Graeff. Owing to illness Dr. G. B. Linderman was unable to represent the individual operators on the line of the Lehigh Valley Railroad. Mr. Jacob R. Graeff is an addition to the regular list, and represents the individual interests of Schuylkill County.

The committee appointed last week to report to this meeting made two reports, Messrs. Gowen and Dickson, making the majority report and the one approved by the meeting. The substance of their report is that the production shall be regulated by a board of control to be composed of one representative from each company. The voting powers of these representatives shall be equal to the percentage of production that may be allotted to the several companies at another meeting to be held on the 27th inst. The programme further provides that each company shall fix its own prices, and shall not have its business interfered with in any other respect than in the controlment of production. For over production a penalty of \$1.25 per ton is established. To secure this each company is to be required to pay to the Board of Control 15c, per ton on each ton of coal mined, or give other satisfactory security for the faithful performance of its obligations. Messrs. Dickson, Hoyt, Gowen, Clark, and Linderman were appointed a committee to report to the meeting to be held next week the precentages to be allowed the several companies. The formation of this favorite nostrum for the ills of the trade is therefore again postponed.

Combination now apparently hinges upon a satisfactory adjustment of the percentages of business the several companies shall have. This is a very delicate question, and one which is being approached with the greatest apprehension, and there is very little probability of unanimity in the decision. On the contrary, it is pretty certain that one or more of the companies would feel that it or they were not get ting their proper share, and though in their suddenly acquired lamb-like disposition, they may be willing to swallow the unpalatable dose, it will be with the mental reservation that with returning financial strength-if that should ever come-they will not submit to it; so that if this question should apparently be settled now, there can be no doubt that it will give trouble in the future.

There is provided in this programme, just as there was in the old combination, a penalty for over-production or bad faith. Since, however, there can be little question but that the whole combination scheme is in violation of the law of the land, there would be no means now any more than there was then, of enforcing the penalty.

Theoretically, the proposed plan is simple, and as there is but one stipulation, that relating to production, it should be easy to fix up the offender in cases of had faith. Should the combination be organized there will be speedily developed a variety of practical difficulties which do not appear on the surface.

Prices are not to be regulated, and as a consequence, if one company is willing to sell its coal at a low price, it will quickly get rid of its quota, and will justly object to having the whole demand limited by the exorbitant prices demanded by some other member of the combination. Moreover, the prices which would yield very satisfactory profits and dividends to one company may be wholly inadequate to pay the fixed charges on its balloon-like neighbor.

Every combination which violates, as does this, the fundamental principles of trade and economy has planted within it the germ of its own dissolution. And as history has abundantly proven, it never fails to beget extravagance in management and cost of production, and to bring ultimate ruin to those joining in it. Nevertheless, a combination is, of course, possible, for when neither personal experience nor 822,085 history can teach, nothing is impossible.

The question, under a combination, seems to present two prominent aspects: 1. If prices are advanced, say two dollars a ton above those of the last auction sale and less than this on the present production would not provide for the fixed charges of more than one of the companies. Wages and cost of production necessarily increasing -then the business will at once receive a most serious check. Bituminous coal will largely take the place of anthracite, and markets in every direction will be curtailed. Much of our now growing export busine in articles requiring for their production the use of coal will then be stopped or impeded—our anthracite iron trade will still further decline, and it will soon be found that with the lessening output these prices will not meet the fixed charges of the companies, and any increase in them will only agravate the evil.

2. If, on the other hand, prices are advanced but little, to a figure that, with present cost of production, would make a satisfactory dividend for some of the companies, and would not materially affect the growth of the trade nor greatly increase the cost of production, then other of the companies will be unable to pay their fixed charges, and will be little or no better off than they now are, while others that might weather the storm by securing a greatly increased business, will suffer severely.

The fact is, no normal, healthy condition of trade an stand the high prices for coal which would be neessary to pay the interest on the enormous indebtedness and capital now represented in the anthracite trade, and the attempt to tax the whole industry of the country in order to save some of the coal companies from the natural result of reckless management and bad investments cannot but be disastrous to taose who attempt it.

There is a faint indication that some at least of the combination talk, and of the apparent harmony now existing between the companies is intended to facilitate financial negotiations, which are looked to for the means to provide for heavy payments early in January. And there is an arriere pensee that when these are provided for the combination may be postponed indefinitely.

In this connection we can only say, that there seems on the surface to be a sincere intention and desire on the part of each of the companies to sacrifice itself for good of its neighbor. Indeed, there is evident a millenial degree of virtue and gentleness which is so foreign to the trade that it makes one, in spite of one's self, somewhat incredulous as to its permanency.

A COAL EXCHANGE. The formation of a Coal Exchange in this city is under consideration. So far as we understand the proposition the presidents of the companies have concluded that their sales-agents know more about the markets and the handling of coal than they do themselves, and it is their intention to have them meet at a room in the Coal and Iron Exchange each day for the purpose of adopting lines of action the most beneficial to the trade, and to offer such coal as they may have for sale. At first this may not assume the character of an exchange, but it is the intention to revive an old charter and establish one as soon as practicable. This is a good move and should be encouraged whether the combination is formed or not.

We give the following quotations as fairly repreenting the nominal prices now asked.

Philadelphia & Reading Coal and Iron Co.'s coals f. o. b., Port Richmond, Philadelphia:

	Steam-		
Lump.	boat.	Broken.	Egg.
Hard white-ash coal\$3 25	<b>\$</b> 3 25	83 25	83 25
Free-burn'g white-ash coal	3 25	3 25	3 25
Schuylkill red-ash coal		****	3 50
Lorberry coal		3 60	3 60
Lykens Valley vein coal		3 75	3 75
	Chest	Chest	
Stove.	No. 1.	No. 2.	Pea.
Hard white-ash coal\$3 50	\$3 00	\$2 75	\$1 75
	3 00	2 75	I 75
benuyikin rod usir com 3 30	3 00		****
Lorberry coal 3 60	3 00	****	
Lykens Valley vein coal 3 75	3 25	****	

The Lehigh & Wilkes-Barre Coal Company, quotes, f. o. b. at Port Johnston:

	Lehigh.	burning.
Lump	\$3 75	\$2 75
Steamer		2 75
Broken	3 25	3 00
Egg	3 25	3 25
Stove	3 50	3 50
Chestnut	3 00	, 300

The Philadelphia & Reading Railroad Company has advanced its tolls, which, to Port Richmond and New York are now 25c. per ton higher. Among others, it issues the following circulars:

#### CIRCULAR 19.

CIRCULAR 19.

From December 17th, 1877, until further notice, and at the option of the shipper, the Main Line freight and tolls upon all anthracite coal shipped from Port Richmond, wherever consigned, will be one-third of the price at which the said coal is sold on board at Port Richmond; provided, the minimum rate of freight and and tolls shall not be less than one dollar and twenty-five cents per ton on stove coal, and one dollar and fifteen cents on all other sizes; and provided that the regulations issued by the Secretary, relative to the adjustment of freight and tolls, be fully complied with by the shipper.

#### CIRCULAR NO. 20.

CIRCULAR No. 20.

From December 17, 1877, until further notice, and at the option of the shipper, the freight and tolls upon anthracite coal by canal from Schuylkill Haven to New York harbor, to points upon the Hudson River, or to points upon Long Island Sound, will be one-half of the price at which said coal is sold alongside at the point of delivery, exclusive of the charge of towing from New York City: provided the net rate of freight and tolls, exclusive of towing from New York City as aforesaid shall not be less than \$2 per ton, and that if the coal is sent in private or leased boats no higher rate of freight will be taken into account then than current in company's line boats: and provided, that the regulations relative to the adjustment of freight and tolls under the circular issued by the secretary are complied with.

CIRCULAR NO. 21.

#### CIRCULAR No. 21.

Notice is hereby given that circulars No. 16 and 17 of October 29th, 1877, are recalled, and the drawbacks therein referred to discontinued;—to take effect on the 17th inst.

The Delaware, Lackawanna & Western Railroad Company will sell at auction on the 28th inst. (next Friday) 75,000 tons of coal.

The production of anthracite for the week ending December 15 was 480,784 tons, as against 471,470 tons for the previous week, "and 392,637 tons for the corresponding week of last year. The total production from January 1 has been 19,287,913 tons, as against 17,456,297 tons for the corresponding period of last year, showing an increase of 1,831,616 tons this year.

#### Bituminous.

This business is being steadily put on a winter basis and furnishes no features of interest.

### New York.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.  At the Ship- Alongsic ping Ports. in New Yor	le k.
Westmoreland and Penn. at Greenwich, Philadelphia	
Kanawha at Richmond 4 10 5 40 Red Bank Cannel Pa. at Philadelphia. 8 00 8 50	
Youghiogheny, Waverly Co., at Balt 4 50 5 65 Deepard, West Va	
Toughosteray, "A "A" of 50 6 00 Murphy Run, West Va., at Baltimore. 4 50 5 85 Fairmount, West Va., " 4 40 5 70 Newburg Orrel, Md. " 4 50 6 00 6 00 6 00 6 00 6 00 6 00 6 00	
Cannelton Cannel, West Va	
Peytona Cannel W. Va. at Richmond 10 De Manufacturing and Steam Coals.	
Cumberland at Georgetown and Alex-	50
andria, Va	50
per ton 2,000 lb.,	h.
Foreign Gas Coals.	
Sterling. Am. cur's	cv

Steri		Am. cur'cy
Newcastle, at Newcastle-on-Tyne8/6	@10/6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 00
" Gas Cannel "	25/6	10@10 5:
Scotch Gas Cannel, at Glasgow, nominal,	25/	7 50
	Gold.	
Block House, at Cow Bay, N. S	I 75	4 50
Caledonia, at Port Caledonia	I 50	4 25
Glace Bay, at Glace Bay	1 00	4 25
Lingan, at Lingan Bay	1 75	****
International mines at Sydney	1 75	4 50
Pictou. Vale mines, at Picton	2 00	4 79
Retail Prices		
Anthracite.		
Day Uha Create and Par	Chan	. Oli automot

Per moso lbs. Grate and Egg.
Pittston coal, delivered ... \$4 50
Lack. coal, delivered below 59th St. 4 00
\*Wilkes-Barre, delivered ... 4 25
\*Lehigh and Locust Mountain, del'd. 4 25 \* These prices are for coal delivered below Canal Street
The prices for coal delivered above that point are 50c. per ton

### Bituminous.

	Delivereu, pe	1 1011 01 2000 10.	
Liverpool H American	louse Cannel 18 o	American Orrel Red Bank Cannel Cumberland	7 00

#### Boston. Dec. 15, 1877

The market is excited and feverish on account of the meeting of the coal magnates Thursday, and the strong probability of a combination being formed. The meeting adjourned to next Tuesday, when a committee appointed to draw up a plan of combination will make its report. We leave our quotations unchanged, though it was rumored yesterday that all the companies had made or were about to make an advance of 50c. per ton over the last circular prices.

We quote Boston wholesale prices as follows:

			40 Caledonia		25
do.	egg 4	25004	40 Cannel, English	16	00
do.	stove	4	50 do. Buckeye	10	00
Franklin	4	75	Lingan	4	50
Cumberland		80(0) 5	no Pictou		75
Clearfield	4	55@4	75 Penn		40
Westmorela	nd	6	40 Youghiogheny	6	40
			-Commercial Rull	otin	

Chicago, Ill.

Specially reported by H. BARNARD.

Specially reported by Messrs, Robert C. Adams & Co. | Wholesale per 2,240 lb. | Scotch Steam | \$4 00 | Cape Breton Steam | \$3 25 | Pictou | 3 75 | Newcastle Smith's | 5 00 Anthracite at retail, per 2,000 lb. delivered.

New Orleans, La. Dec. 15, 1877. Specially reported by Messrs. C. A. MILTENBERGER & Co.

Per ton of 2,000 lb. 46

#### Philadelphia. Dec. 20, 1877. Specially Reported,

Specially Reported,

A very sudden advance in tolls taking place last Monday, the rates being those ruling before the last decline, has affected the shipments from Richmond. Many orders on hand a week ago have been countermanded since. Little or no business can be expected at the present advanced prices until the buyers have become confident that the combination now under way will be an accomplished fact.

The local trade is active, notwithstanding the unusual mild weather. The demand is not from consumers, but from dealers who desire to hava a large stock on hand, a general stoppage on the first of the year for a few being expected.

Vessels continue scarce here, and freights rising—\$2 being the lowest rate to Boston. Many vessels are laid up for the winter.

Pittston, Pa. Dec. 17, 1877 Pennsylvania Coal Company's Coal ir yard, ton of 2000 lb.

Lump, Egg and Stove. Retail. \$2 25 hestnut. 2 oc.

eea. 1 oc.
Delivered, fifty cents per ton additional Dec. 20, 1877. Richmond, Va.

Specially reported by S. H. HAWES, Dealer in Coal. 

#### San Francisco, Cal.

From the Commercial Herald of Dec. 13, 1877.

From the Commercial Herald of Dec. 13, 1877.

COAL—Imports from January 1 to Dec. 1:
Tons.

Anthracite. 19,691 Vancouver Island. 94,501

Rocky Mountain. 123

Coos Bay. 27,581 Saghalien. 190

Cumberland. 10,608 Seattle. 94,491

English. 89,362 Bellingham Bay. 10,475

Chili. 8,145 Ione, Cal. 3,068

Mt. Diablo, 87,755 Carbondale, Cal. 177

Arrivals for the week under review embrace the following cargoes: Ship Shirley, 1,500 tons Wellington from British Columbia. This is esteemed one of the best varieties in use for domestic household purposes, ranging with Nanaimo and Seattle. Supplies of all three of the Northern mines named form an important place in the statistics of the port. The two first named

are located on Vancouver Island, British Columbia, and the Seattle mines in Washington Territory. From New South Wales we have the Argomene, with 2,000 tons, and the Ennerdale with 1,798 tons. The market is dull and prices both low and nominal. The Amador Ledger has been informed by Alexander Thompson, of Buena Vista, "that William Cook, of Jackson Valley, in boring for an artesian well a few days ago. struck a seam of coal of unknown thickness. The coal is said to be far superior to any heretofore discovered in the valley. Indeed the coal is good enough to heat iron to the welding-point—something that blacksmiths cannot do with lone coal. In case the bed proves to be extensive, which there is no reason to doubt, the discovery is of great value, and will have an important bearing upon the future of Jackson Valley."

COAL IN SOUTHERN CALIFORNIA.—William A. Witte, who, with his brother, discovered the Black Diamond Coal Mine in the Santiago Canon, yesterday brought to the Herald office several specimens of the coal, one lump weighing about fifty pounds. It resembles Cannel coal very much, with an occasional strip of bituminous, and burns very freely, making a bright clear blaze. He informed us that the vein is about five feet thick, with a thin streak of sandstone running almost through the center. That portion of the coal above the sandstone streak is all of the Cannel variety, while that below is streaked with thin layers of bituminous. As he goes in upon the vein the bituminous layers increase in thickness, and he thinks that when he gets in deeper the Cannel coal will be entirely displaced by the other. Mr. Witte and his brother, who both have had large experience in Eastern coal fields, are of the opinion that the deposit in the Santiago Canon is quite extensive, and that when fully and properly worked, it will prove one of the most valuable possessions in Southern California. The steammaking qualities of the coal are being tested by the Messrs. McFadden, on the steamer Newport.—Los Angeles Herald, December

#### Freights on Bituminous Coals from the Mines to Tide Water Shipping Ports.

For the above rates we refer to our issue of Nov. 17. For freights on *Lehigh and Wyoming Coal* we refer to our issue of Sept. 15.

For rates of freights on the Chesapeake & Ohio Railroad we refer to our issue of Dec. 1.

**Towing**. For the above see issue of December 1.

### Freights

Per ton of 2240 lb.

Representing the latest actual charters to Dec. 20, 1877

Ports.	From Philadelphia.	From Baltimore	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me				2 25
Albany		****	****	
Alexandria, Va	1 50		****	
Brooklyn, N.Y Bangor, Me	****	****	****	***
Bangor, Me	****	****	***	1 60
Bath, Me	55@65	1 70		1 50
Baltimore		* ***	****	
Boston, Mass Bridgeport, Ct	177@180	I 70		1 50
Rejetal R I		33		90
Beverly, Mass				1 50
Cambridge, Mass				1 50
Charleston, S.C	1 05	****	****	****
	****	****	****	
East Cambridge, Mass	****	****	****	****
Fredericksburg, Va.	****	***	****	
Fall River	1 35	1 35	****	90
Gloucester		****		****
Hartford, Conn	****		****	1
Hohoken	***	****	****	4C
Hoboken		****		****
Jersey City				40
Lynn, Mass				
Medford, Mass		44.4	****	
Middletown	****	****	****	90
Milton Mass	****	****	****	***
Nantucket, Mass	****		****	90
New Bedford	***	1 85	****	90
Newburyport New Haven	****	1 35	****	1 75
New London		1 35	***	70
Newport		- 3:	****	90
New York	75@90	1 30		40
Newark, N.J	****			1
Newark, N.J Norfolk, Va	80@85			
Norwich	****	****		90
Pawtucket	****		****	1 00
Philadelphia	***	***	****	
Portland Portsmouth, N. H	1 60	1 70	****	1 50
Providence	****	1 85	****	1 65
Providence	1 25	1 35	** *	90
Rocknort			***	***
Petersburg, Va Rockport Richmond, Va	1 15			****
Saco		****		I 75
Saco	****	1 70	****	1 50
Saybrook, Mass				
Savannah, Ga Somerset, Mass			****	****
Somerset, Mass	****	****		90
Troy	****	****	****	
Wareham	****	1 55	****	
Washington	1 50	****	****	
West Farms, N.Y	****	****	**	*
West Laures, W. I		****	1	1

#### Rates of Transportation on Anthracite Coal to Tide Ports.

From Pine Grove.			From Pine Grove.			From Tamaqua.			Tamaqua. From Schuylkill Haven.			From	
	1 7	70	1	6	65	1	50						
1	1 1	10	1	6	бо	I	45	-					
I	1 3	37	I	4.4	32	I	17	-					
I	I 4	49	I		44	E	29						
	9	93	I	1	32	E	17						
I	I !	52	1		47	-	32						
	\$	84			**			-					
* *	* *					Action of the control	40						
-	-	-											

From Tamanend, to Catawissa, McAuley, Mainville, Rupert, and Danrille, via Catawissa and Williams-port Branch Railroad. From Tamanend to Williamsport, Hall's, and Mon-toureville, via Catawissa and Williamsport Branch Railroad.

#### IRON MARKET REVIEW.

#### New York.

FRIDAY EVENING, Dec. 21, 1877.

American Pig.-The lateness of the season and the approach of the holidays has reduced business to the smallest dimensions. This is not an unusual or unexpected state of affairs, yet it has had a demoralizing effect on prices, which are decidedly weaker than they were a month ago. The present condition of business produces a depressed feeling, and, generally, we get little encouragement for the future, but even this is not an unusual state of affairs for this time of the year, while we have generally seen it followed by an active business before the first of February. It would be much better for the iron trade if the purchases of next year should be pretty evenly distributed according to the wants, and that they should not be too large at the beginning of the year, for this would only lead to putting in blast additional furnaces, and tend to make a demoralized market. We quote, No. 1 foundry at \$18; No. 2 foundry, \$17; and forge, \$16. Some brands are offered on the basis of \$17 for No. 1 foundry.

Scotch Pig. -Sales are only in a small way for consumption, and foot up about 100 tons of Coltness, and 200 tons of Eglinton. We quote, Eglinton at \$24; Coltness, \$26; and Glengarnock, \$24.50.

Rails.-Thelarge sale of steel rails to the Pennsylvania railroad is now reported to be from 35,000 to 40,000 tons at \$40 at the works. In addition to this there has been a sale of 8,000 tons to the Lake Shore railroad at the same figure, and other business, making a total of about 50.000 tons. The Erie is reported to be in the market for 20,000 tons, while the Lake Shore and some of the other large roads will probably make further purchases. With the business that has previously been reported the steel mills are liberally supplied with orders, yet prices do not stiffen, nor are there any immediate indications of their doing so, as the large runs constantly reported show a devoloping capacity in the existing plant far in excess of the requirements of the country. We quote iron rails at mills at \$33@37.

Old Rails.-We are reported sales aggregating 1,800 tonsat \$18@18.50, which may be considered the

Wrought Scrap. - We learn of no business and quote nominally at \$22@22.50.

Battimore, Md. Dec. 17, 18 Specially reported by Messrs. R. C. Hoffman & Co. Dec. 17, 1877 The pig iron market for the past week has been unusually dull. We quote prices as follows:

Dec. 20, 1877. Specially reported by Palen & Burns.

? Quotations on pig iron in this market remain unchanged since our last. Market inactive. Our foundrymen report an increased business for the year, but at reduced prices.

No. 2 \$20 91
Gray forge. 18 91
American Scotch A : Foundry. 24 25
Cherry Valley B 1 \$21 25
Per gross ton 4 month.

Per gross ton 4 months delivery here.

Chattanooga, Tenn., Dec. 18, 1877. Specially reported by J. F. James, dealer in pig iron, ores, etc

Specially reported by J. F. James, dealer in pig iron, ores, etc. The general tone of the iron trade South remains unchanged. A few small orders in single car load lots to carry the foundries over the holidays have been filled during the past week. No large sales to report except 200 tons of charcoal mill pig for the West. Two of our charcoal furnaces have reported to me a determination to blow out as soon as their present stock of fuel is consumed not feeling justified in running any longer in the face of the long continued depression in the trade. There is some talk of "Ridge Valley" blowing in early in January. Rising Fawn has already resumed a few days since No change in prices to report. No change in prices to report.

Dec. 19, 1877. Columbus, O.

Specially reported by King, Gilbert & Warner, dealers in Pig Iron and Ores.

Trade for the past week has been fair with no changes to note in prices. We quote as follows:

FOUNDRY IRONS.

No. : Hocking Valley soft and strong from pure | MILL HOSS | 18 50 to 19 00 | Mottled and white neutral | 17 50 to 18 00 | Gray cold short | 17 50 to 18 00 | Mottled and white cold short | 17 50 to 18 00 | Mottled and white cold short | 16 50 to 17 00 | Mottled and white cold short | 16 50 to 17 00 | Mottled and white cold short | 18 50 to 17 00 | Mottled and white cold short | 18 50 to 19 00 | Mottled and white cold short | 18 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and white cold short | 19 50 to 19 00 | Mottled and whi Louisviile, Ky. Dec. 18, 187 Specially reported by Messrs. George H. Hull & Co. Dec. 18, 1877.

We have no change of importance to chronicle since last report. Purchasers are buying to tide over New Years; are indisposed to purchase largely for future delivery. The usual time, four months, allowed on containing helow. quotations below.

FOUNDRY IRONS.			
No. 1 Ha ging Rock, Charcoal			
No. 2 " " "	20	00(0)21	00
No. 1 Southern Charcoal			
No. 2 " "	19	00@20	00
No. 1 Hanging Rock, Stonecoal and Coke	20	00@22	00
No. 2 " " " " " " "	19	00@20	00
No. 1Southern Stonecoal and Coke	IQ	00(0,20	00
No. 2 " " " " "	18	00@19	00
"American Scotch"	20	00@22	00
Silver Gray	18	00@19	00
WILL IDONG			

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for The Engineering and Mining Journal, by Justice Cox, Jr., & Co., Iron Merchants, 313 Walnut Street, Philadelphia, Week ending Dec. 20, 1877.]

Pig Iron.—There has been quite a movement in pig

PIG IRON.—There has been quite a movement in pig the past week, several large sales are reported with deliveries into the new year, and contrary to usage and expectation several quite large sales for immediate delivery. A feeling seems to have gotten abroad that prices would be firmer if not advanced after the new year comes in, hence the sales. And then again, some contracts pending for some time have been closed that will take quite an amount of iron in one way and another. We report sales of about 5,000 tons, and quote No. 1 \$18.50 to \$20; No. 2 \$17 to \$18.50; Gray Forge, \$16 to \$17.50, all Philadelphia delivery.

MANUFACTURED IRON.—In bars, very little in the way of business can be reported. Prices are firm but most consumers of bars are holding off until after stock-taking time and the new year comes, when it is hoped there will be more business to re-

port. In plate and tank there is a little more doing some orders have been placed for immediate shipment. In skelp nothing is reported, most mills making this class of iron are shut down until after the holidays, if they start up they depend on orders. We quote bars 2 to 2 1-10c. per lb.; plate and tank, 2½ to 6c. as to quality; skelp, 2 1-10 to 2½c. per lb. RAILS.—Nothing new in steel rails to report this week. The mills running have all they can do for some time to come. In iron rails little or nothing is doing. We quote steel \$41 to \$43 at mill; iron \$32 to \$35 at mill.

OLD RAILS continue scarce and good prices are obtained for all lots for immediate delivery. The market is bare of stock and prices are advancing. We quote \$20 to \$21.

Ret is bare of stock and prices are advancing. We quote \$20 to \$21.

OLD WHEELS are in plentiful supply at low prices. We quote \$17 to \$18 with offers for round lots a dollar off for cash.

SCRAP.—Wrought scrap is dull of sale, and low prices are quoted. We quote \$20 to \$24; cast \$12 to \$16.

St. Louis, Mo. Dec. 18, 1877.
Specially reported by Messrs. Spooner & Collins, Commission Agents for all kinds of Iron.
Pig iron is in fair demand and present prospects indicate a good demand through the winter. Most of our foundries and mills have small stocks of pig iron on hand, and any indication of prosperity for the coming year we think must increase the demand to that extent that an advance in prices is almost a certainty. certainty.

Hanging Rock         25%           Tennessee         26%           Kentucky         26%           Missouri         26%           Georgia         26%           Alabama         26%	38 Asso 30 No. 1 30 Heav 30 Ligh 30 Old 1	rted Bar l Wrough y cast t 'ails	t Scrap	80c. cwt.
:	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coai	\$22 00 22 00	\$21 00 21 00	\$20 00	
Tennessee charcoal Tenn. coke very soft and	22 50	21 00	20 00	19 00

1 cm. coke very soft and strong	23 00	21 00	20 00
1 cm. cold short	25 00	24 00	23 00
1 cm. cold short	Ex No.1	No. 1, B No. 1,	
2 cm. cold short	25 00	24 00	23 00
2 cm. cold short	25 00	24 00	
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2 cm. cold short	25 00	25 00	
2 cm. cold short	25 00	25 00	
2 cm. cold short	25 00	25 00	
2 cm. cold short	25 00	25 00 Alice Hanging Rock coke.	\$25 00 Quinnimount, W.Va., coke

#### METALS.

NEW YORK, FRIDAY EVENING, Dec. 21, 1877.

The quietness usual to the last fortnight of the year has appeared to an unusual degree this year. The attitude of England on the Eastern question has, and is likely to have, a disturbing influence on the metal market until Parliament convenes in January.

Gold Coin.—The price of gold has ranged from 1025% to 1027%, and closed at 102%.

Bullion.-Silver has improved in London since the award of the India Council bills on Wednes day, at 3%d. advance over last week's award, and is correspondingly higher here. This advance was unexpected in London and must have had a special cause not yet known here. The quotations are 1171/2 in this city; 8 per cent. discount in San Francisco, and 541/8d. in London.

Date.	London.	New York.		Date.		New York.
Date.	Pence	Cents		Date.	Pence	Cents
Dec. 15	5378	116%	6.6	19	541/8	117

BULLION SHIPMENTS We give below a statement showing the amount of of the latest bullion shipments in addition to these an-

noun	ced in our issue of December 15		
Dec.		 \$151,150	00
6.6	Consolidated Virginia "	 (4)831,337	2
6.6	StandardCal.	 39,426	
66	4 GilaNev.	 6,144	00
66		 12,419	00
6.6	10 Martin White "	 17,084	00
Nov.		 (*)21,170	00
6.6	Grand Prize	 (*) 121,530	0

From 1st to 11th inclusive. For month of November.

BULLION TAXES.—The bullion taxes of the Californian and Consolidated Virginia paid for the quarter ending Sept. 30th amounted to \$156,036.87.

Copper.-There is no business worthy of note doing in this market. The large holders are asking 18c., while only 175%c. is bid for large lots. We can call the market only 17%c. although but a very small quantity could probably be obtained at this figure. According to cable advices, Chili Bars (g. o. b.), were quoted at £65 10s. with buyers, and a quiet market.

Messrs Vivian, Younger & Bond of London, under date of December 7 say of copper: "A variety of very strong reasons and arguments have been brought to bear on this article by the buyers to cause a general feeling of depression throughout the

trade, and the success is to be seen in the exceedingly low prices which have been accepted for English copper and Chili produce; prices which have only ruled once before during the present generation, and then it was under the influence of panic during the Franco-German war, when the trade was brought to a standstill, and we had then a stock of 35,417 tons, and affoat and chartered for 9,586 tons, total 45,003 tons in copper, against the present stock of 29,974 tons, or 9,320 tons more in 1870 than now. During the last few days, however, the consumers have taken heart a little, and some pretty considerable purchases having been made, prices for all sorts of raw copper have advanced about 20s. a ton from the worst. It is estimated the purchases for consumption and shipment during the last week amount to about 5,000 tons.

The quantity of Chili bars, ores, and regulus in stock at and afloat for Liverpool, Swansea, and Havre, and of English and foreign copper in London is thus estimated in fine copper: trade, and the success is to be seen in the exceedingly

estimated in fine copper:		
Dec 1.	Dec. 1.	Dec. r.
	1876.	1875.
Stock29,974	25,477	21,097
Chili produce shipping and afloat		
per mail advices 5,700	6,890	8,700
Total, tons35,674	32,227	29,797
Dec. 1.	Nov. r.	Oct. 1.
	1877.	
Stock	31,005	30,652
per mail advices 5,700	4,350	4,200
Total, tons	35,355	34,852
cable advices received up to		
date 4,500	4,000	3,800
Australian produce afloat 800	1,600	1,200
The actual exports of bars, ores, and	regulus	in fine
copper from Chili during the first nine lowing years were as under:	months	of fol-
	1876.	1885.
Tous34,200		
	13 1	may a

Tin.—There has been no business in this article in this market. The closing quotations, in gold, per pound, are: Straits, on spot, 15\(\frac{1}{2}\)d, and to arrive late in January, or early in February, 15\(\frac{1}{2}\)c; L. & F., 15\(\frac{1}{2}\)c; Refined, 15\(\frac{7}{2}\)c; and Banca, 171/2c. The quotations on the 18th inst. were at Penang \$19 and Singapore, \$19.75, with exchange at 4 s 1/4d. The shipments from the Sraits to the United States for the first fortnight of December, ammounted to 300 tons by steam. According to cable advices the London market closed to-day with buyers at £66 15 s. for Straits, with upward tendency.

Messrs. Vivian, Younger & Bond of London, under date of December 7, say of tin: "The trade doing has been good, and the deliveries of foreign, as will be seen from the undernoted figures, have been very heavy. The price has gone back a little, but at current rates there is a firm market. There is a fair amount of evidence that these values tend to pretty considerably increase the consumption, and to some extent curtail production, but the stock is large, and therefore naturally any advance in prices seem to check business.

The stock of foreign tin in London

eck business. The stock of foreign tin in London and Holland is

The contract of	18	77	1876.	1875.
	ist Nov.	ist Dec.	1st Dec.	rst Dec
	Tons.	Tons.	Tons.	Tons.
For'gn tin in London		8,737	7,856	5,950
Banca tin in Holland		1,544	1,328	1,130
" (in Co.'s hands		416	495	1,920
Billiton tin in Holland	1.280	1.283	0.26	770

12,444 11,980 10,615 9,770 Quantity of tin afloat for Europe ...... 2,500 3,000 Quotat'ns on the same dates being Straits. £70 £66 10/ 3,800 3,500

Tin Plates.-The business in these, as in all other articles on this list, has been very quiet. We quote, in gold, per box, as follows: Charcoal tins, \$6,25@\$6. 371/2, and ternes, \$6; Coke tins, \$5.371/2@ \$5.40, ternes, \$5.50@\$5.371/2.

£77

\$5.40, ternes, \$5.50@\$5.37\footnote{5}.37\footnote{5}. Messrs. Robert Crooks & Co., of Liverpool, under date of December 6, say of tin and terne plates: "Most of the large buyers are keeping out of the market, which is consequently very flat. For charcoal tins there has been more inquiry, and this may result in business at slightly under makers' present spot rates, for delivery over opening months of next year. Ternes are decidedly weaker, with the exception of a few favorite brands. Coke tins for future could be booked at lowest rate for present delivery, but this does not tempt buyers, who expect lower rates."

Lead.-This article is nominal at 41/2 c., with nothing doing.

**Spelter and Zinc.**—Spelter is quiet at 5.75e. 5.80 c. Sheet zinc has been further reduced in price and is quoted at 71/8@71/4c.

Antimony is quiet at 12 c. for Hallett's, and 123/ for Cookson's.

Quicksilver.—The San Francisco Commercial-Herald of December 13 says; "Leading holders con-

tinue firm in their demands at 47½c., and at which moderate sales have been made, but at present the export demand is light and shippers not disposed to purchase freely at over 45@4c. The production of the State is now much less than it was in midsummer, and some of our largest mine producers say that there is very little profit at under 50c." The Napa Register, speaking of the Great Western Quicksilver Mine, says: "Some 225 men, mostly Chinamen, are employed by the company; 120 tons of ore are reduced per day, and from 500 to 600 flasks of quicksilver are bottled every month. During the last year the company has paid off all its debts, made \$20,000 worth of improvements, and disbursed a \$50,000 dividend. The monthly payroll foots up \$10,000. In the vicinity of the mine there are 20 or 30 families." The market at the close exhibits increasing firmness. Price, 47½c. Receipts for its increasing firmness. Price, 47½c. Receipts for the week, 1,009 flasks.

#### Salt Lake Ore and Metal Market.

SALT LAKE CITY, UTAH, December 21, 1877.

Argentiferous Lead (Base Bullion).—\$40 per ton for lead; \$1.17 per ounce for silver: \$20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 80 to 120

ounces per ton of 2,000 lb.

Ore and bullion shipments from Salt Lake during week ending Dec. 8, 1877:

Consignor, Smelting Works	Consignee,		lb.	Totals.
Morgan	Penn'a L. Co.		87.934	
Telegraph	4.6		31,262	
Frisco	4.6		81,760	
Mingo	44		95,142	
Durell	4.6		41,956	
Pascoe			21,309	659,363
Durell		Chic	21,099	21,099
Germania			42,931	

Germania	Omaha		42,931	42,931
	ODE			723,393
	ORE.		11.	man I
Consignor. Telegraph MineS	Consignee acramento,	Cal		
Yosemite "	Hilliard		189,000	
ConklinSampl. W.	miniard		21,000	
Mackintosh "	Omaha		41,000	41,000
Shoebridge Mine, B	Works, Co			*11,030
1				

\* Copper ore.

#### FINANCIAL.

571,100

#### New York Stocks.

NEW YORK, Friday Evening, December 21, 1877. The total sales of the coal stocks has been but about 110,000 shares. As has been the case for several weeks, prices have been fluctuating under various rumors, favorable or unfavorable to a cual combination. From the slight advance that has been secured in these stocks since combination meetings began to be held, it is evident that the "street" has but little confidence in a combination being formed, or else that it was fully discounted in the advance established during the summer. The sales of Delaware & Hudson Canal have aggregated 13,554 shares at 52½ @50, closing at 51½. Delaware, Lackawanna & Western has been dealt in to the extent of 95,260 shares at 49½ @51½, closing at 50½. 10,000 shares. As has been the case for several weeks closing at 501/8

closing at 50\%.

New Jersey Central Railroad.—This stock has been steady during the week, and closes at 13\% with sales of 1,500 shares. The New York Guaranty and Indemnity Co., who are the Trustees of the consolidated mortgage, bondholders have instructed their counsel, Wm. Butler Duncan, to take measures at once to foreclose the road. The holders of over \\$2,000,000 of the bonds have signed the agreement of reorganization during the past three days. Leaving out of account those who may have signed in London, this makes an aggregate of \\$9,000,000 of signatures out of \\$20,000,000 thus far. Mr. John S. Kennedy, one of the sub-committee of the consolidated bondholders, recently said that he did not know whether the first mortgage bondholders or the stockholders would fight or not.

James River & Kanawha Canal.—The damage done

the stockholders would fight or not.

James River & Kanaucha Canal,—The damage done to this canal by the recent freshets was so great that it will be a very difficult matter for the company to raise money for the repairs. Some sections of the canal will have to be rebuilt. In view of this state of affairs it is suggested that the canal be abandoned altogether as a canal and its works be used as the road bed of a railroad. A proposition is already before the Richmond City Council for city subscription for this purpose. It is said that the necessary changes can be made and the rails laid in about the same time as would be required to put the canal in working order as would be required to put the canal in working order

The Cleveland, Columbus, Cincinnati & Ohio Rail-road Company will build this winter at its docks in Cleveland, Ohio, extensive steam hoisting apparatus for the transfer of coal from cars to lake vessels. This will be in addition to the shutes now in use at the

will be in addition to the shutes now in use at the docks.

The Columbus and Coal Valley Extention Railroad Company, organized a short time ago to build a line from Columbus southeast to McConnellsville, has been consolidated with the Columbus and Northwestern Railroad Company, another new company, which proposes building from Columbus to Fort Wayne, Ind.

#### Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here at Philadelphia, and Baltimore for the week ending the 21st inst. are given in the following tables. The Philadelphia quotations will have a \*affixed. The Baltimore quotations are indicated thus †.

	-40	OTATIO	N8	
	High- est.	Low- est.	Clos-	Sales Shares
American Coal Co	-	-	35	
*Cambria Iron Co	-	-	50	_
*Pennsylvania Salt Manf'g Co.	-	-	64	-
*Westmoreland Coal Co		-	12	-
*Buck Mountain Coal Co		-	25	-
*Schuylkill Nav. Co		-	_	-
St. Louis, I. M. & S. RR. Co	734	734	73/2	300
Spring Mountain Coal Co	-		35	
+Balt. & Ohio RR. Co. pref	-	-	-	_
" common	-	-	ICO	50
+Pittsburg & Connellsville RR.		_		_
†George Creek Coal Co		-	99	
tSants lara Mining Co	-		81,4	
†Atl ric Coal Co		MORE TO A	1,30	_

BONDS.				
D. L. & W.78, Convt., 1892 J. & D.	_	_	_	
" 2d mtge., 1881 M. & S.	-	300 (100)	A	-
N. J. C., 1st mtge., new F. & A.	-	-	1123/4	-
" " 1st mt., cons. 1899 Q.	66	-	66	\$6,000
" " Convt M. & N.	01/2	_	003/4	7,000
L. & W. B. Coal Co., cons. Q.	33	31	311/4	7,000
Am. Dock & Imp. 78 J. & J.	-	-	42	-
D. & H. C. Co., 1st m., 1884 J. & J.	-	10000	-	Mille
" " " " 1801 J. & J.	99%	-	Thirty.	6,000
" " " " 1877 J. & J.	-	_	Million .	-
" " " reg., 1894 A. & O.	-	-	941/2	
" " " coup , 1894 A. & O.	94	-	94	3,000
St. L.I. M. & S., 1st mt. 1892 F. & A.	10214	1021/2	24	16,000
Ches. & Ohio, 1st mt., 1899 -	-3/4	-	Manager.	-
*L. V. RR., con. m. 68, 1923 J. & D.	95	_	913/4	11,000
" 2d m., 78, 1910 M. & S.		_	9.74	1,000
" " Peg 7808 J & D	10814	man.	1081/2	6,000
" reg., 1898 J. & D. " coup., 18-8 J. & D.	-	-	100/2	0.000
*P. RR., 1st mtge., 1880 J. & J.	108			1,000
" Gen. mtge. reg., 1910 A. & O.	100	_	1081/8	
" Con. m. 68. cou 1905 J. & D.		_		2,000
" " reg. 1905 Q.	92	-	92	1,000
			108	
" gen M. Coup., 191c J. & J.			105	2,000
" New Loan 58	III	-	_	8,200
*P. & R. RR., 78, 1893 A. & O.	3/	-	- 1/	
Con. Mi./E. Cou. 1911 g. de 17.		100	10014	19,000
Deb. 08, 10930. 00 0.	-	_	-	_
New Convt. 78.1093 0. & 0.	57	NAME OF TAXABLE PARTY.	55	100
Con. mige. 78. reg. a. & D.	10 /2	100	1001/4	19,000
00, 44.00 1000 0. 20 0.	105/2		-	1,000
*P. & R. C. & I. Co. Deb. 78 M. & S.	-	-	_	Access
*P. & R. C. & I. Co —		-		-
*L. C. & N. Co. 6s. 1884 M. & Q.	103	_	1031/2	5.153
Itt. Ioun roy F. OF G.	102%	-	104	1,000
" Con. mtge. 78. J. & D.	-	-	-	_
" Cvt. gold, 1894 M. & S.	91	90%	901/2	6,000
" Gold Loan, 1897 J. & D.	87%	_	87	2,000
Schuylkill Nav., 68. 1897 M & Q	-	-	-	-
Pa, and N. Y. Canal, 78. J. & D.		ima	III	3,000
Pa. Canal Co J. & J.	man	-	00	1010
Susquehanna Coal Co. 6s	-	Trees	-	-
tChes. & Ohio 1st m. 6s. M. & N			-	_
+Balt. & Ohio 68. 1880 J. & J	105	_	104	500
† " 68. 1885 A. & O	105	-	1041/2	
			4/4	-82-

### Philadelphia Stocks.

PHILADELPHIA, Friday Evening, Dec. 21, 1877.

Quite a dull market has characterized the operations in coal shares during the business of the past week on the Philadelphia stock market. The quotations remain at nearly the same prices as recorded in our last issue, with very steady fluctuations throughout the dealings of the week. The total transactions scarcely reach 50,000 shares, the bulk of which were in Pennsylvania Railroad, and the Philadelphia & Reading, 25,000 shares being in the former, and 22,000 shares in the stock of the latter company. Regarding the improvements in Pittsburg, proposed by the Pennsylvania Railroad, the Philadelphia North American of the 21st inst. says: "The ordinance authorizing the changes proposed by the Pennsylvania Railroad in making its improvements in Pittsburg, has passed Common Councils, and will doubtless receive the favorable action of Select Council. This, says the Commercial Gazette, will open the way for the extensive improvements proposed, if the delay has not resulted in such preparations as will preclude any change." PHILADELPHIA, Friday Evening, Dec. 21, 1877.

Cambria Iron Co.-The annual meeting of this com-

pany will be held on the 15th of January, 1878.

United New Jersey Railroad and Canal Co.—This company announces its regular quarterly dividend of 2½ per cent., payable on the 10th of January, recovery. 2½ per cent., payable on the 10th of January, proximo.
Mount Farm Coal and Oil Co.—This company an-

Pussaic N. J., Zinc Co.—The annual meeting of this company will be held on the 23d of January, proximo. AUCTION SALES OF STOCKS AND BONDS—The following stocks and bonds were sold at auction during the week.

Pennsylvania Railroad Co.-80 shares at 315% per

Reading Railroad Co.—16 shares at 16% per share. Lehigh Valley Railroad Co.—9 shares at 40½ per are. Pennsylvania Canal Co.—\$10,000 6 per cent. bonds

at 60% per cent.

Pennsylvania Salt Manufacturing Co.—\$1,000 bonds

at 103% per cent.

United Railroads of New Jersey.—\$3,000 6 per cent. bonds at 101½ per cent.

Pennsylvania Oil Creek Petroleum Co.—The annual meeting of this company will be held Jan. 8.

### COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Vein. Capital Stock		SHARE	s.	Assessments.				Dividends.				HIGHEST AND LOWEST QUOTATIONS PER SHARE IN CURRENCY.								IN	0						
				No.	Par Val.	Total levied to date.	ame	ate an	per	Total paid to date.	Last	Divid	end.	Rate per Ann.	Dec.	-			-	_	-	-	-		_	-	SALES
					-							_	-	Per	H.	L.	H.		н.	L.	Н.	L	Н.	L.	Н.	L.	
Coal Stocks.	M-1		\$		****		Mo.	Yr.	Amt.	5	-	Yr.															
el. & H. Canal, el., Lac. & W.RR	Pa.		20,000,000	200,000	100	*				38,821,10	4 Aug.		21/2	9	511/6	511 8	52	511/4	521/4	50	521/8	501/2	52	51	51 7/8	511/2	13.5
high C. & Nav	Pa.		26,200,000	208,971	50	*				****		1876	11/2		44		51/2		181/2	183/8	183/4	1834	181/2	181/2	181/2	1814	95,2
chigh Valley RR	Md.		4,400,000		100	*				****	Oct. Jan	1877	11/2	5	40-/8	40 /2	4078	40,2	40/2	4C3/8	4034	403/4	401/2	401/2	40%	401/2	2,0
J. Central RE	Pa.		5,000,000		50	*					Apr.	1876	2½ 3		1332	131/2	13	13	13	123/4	131/2	131/8	14%	135/8			1,5
ennsylvania RR nil. & Read. RR	Pa.	::::	68,870,200 34,278,175	1,377,404	50 50	*				43,012,49	Nov.	1877	11/2	8			32 1/8 165/8	313/4	31/8	315/9	32	31% 16½	321/8	32 16%	32½ 16½	32	25,2
eneral Mining Stocks																											
lpha Cons. c. s merican	Nev.	300	3,000,000		100		Aug.	1877	\$1 00		Dec.			12	61/8	53/	61/2	6	634	63/8		63%		61/		61/	6.3
m. Fiag, G	Colo.	5,300	600,000	50,000	10		Sont	-0							110	100							7	61/2	7 11C	636	13,2
elcher. G. Sertha & Edith G	Vir.	645 acs.	3,500,000	350,000		*				-313971=-	o Apr.		\$1 00		40		40		40		40	30	40	3C		*:	5.9
est and Belcher, G. S. obtail, G	Colo.	545 2,500	1 136,630		100	*										1.	**				1::		**			:	4.5
obtail Tunnel, 6 ullion, 6. s	Colo.		100,000	20,000	5	6,000	Oct.	1873	0 30	20,00	Dec.										1						
aledonia, g. s	Nev.	2,188	10,000,000	100,000	100	1,435,000	Oct.	1877	75							1.	1						::				
alifornia, g. s uollar Potosi, g. s	Nev.	1,400	2,800,000	28,000	100	1,500,000			3 00	3,080,00	Feb.	1877	2 00 I 00	0 74		1	1::	1::			1				30		
eveland, Gons. Hercules & Roe.	Colo.	3.715	1,000,000			*				120,00						1						11					
ons. Imperial, g. s on.N. Slope & E.C.T.	Nev.	468	500,000	500,000	100	575,00	Oct.	1877	0 20						**						1		1				
ons. Virginia, G. S	Nev.	710	54,000,000	540,000	100	474,60	June	187	3 3 00		Nov Mov	1877	2 0	0 24	1	1::	**		24%		1::		**		**	:.	
onfidence, G. S rown Point, G, S	Nev.	600	2,496,000	100,000	100	1,573,37	Sept	187	7 1 00	78,00	May Jan.	. 1805	8 %		3	1			.:	**						**	
ouglasureka Cons. G. s. L.	Nev.		5,000,000			3	May				oo Oct.	1877	2.0	1	1::	**	1:	1:	1::	1::	1::	**	::			**	
ureka G. Mg. G xchequer, G. s	Cal'f			20,000	100		Sept			2,134.0	oo Aug	1877	10	0													
lould and Curry, G. 8	Nev.	612	10,800,000	108,000	100	2,450,00	ohug	. 187	7 1 0	3,826,8	oo Oct.	. 1870	10 0	0	1.					1:	1:		::	1::	**		
ranville Gold	. Nev.	400	11,200,000	112,000	100		Oct.	187	7 1 0	1,598,0	oo Apr	. 1871	5 0	0 15	1::	1				1:		**	**	:	1.		1
lenry Tunnel	Nev.	3,000	1,000,000				1	1:::			oo Dec.				**	1::		1:	1		1		1				
ulia Cons., g. s ustice, g. s	Nev.	3,000	11,000,000	0 110,000	10	440,00	Aug Oct	187	7 1 0								1		35		1		47				
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eopard, L. s. s	. Nev.	1.500	5,000,000			. *	July				oo Dec		0 5	0	1		1	1					1				:
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Merrimac, s Mexican, g. s	. Nev.	600	10,080,00	0 100,800		0	Aug	187	7 0 3		oo Dec		1			1:			1:	1:		1::	1::				:
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Ophir, c. s Original Comstock,c.	. Nev.	675	10,080,00	08,001	O IO	2,934,4	Mag	y. 187	5 2 0	T,394,4	oc Mai	1864	4 4	50 6					297						297	5	
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Union Cons., G. s West Belcher, G. s	. Nev	1,000	10,000,00				oo Oct			25	***																1
Yellow Jacket, 6. s Young America, s	. Nev	. 1,200	12,000,00			3,198,0	oo Sep	t. 18	77 0		000 Au		1 2	50	1								1				
Copper Stocks.																			and divine and			1				1	
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Central, c	Mic	h	2,000,00	20,00	C 2	1,200,0	oo Jui	ne 18	62 0		ooo Fe	b. 187	7 7			****											
Copper Falls, c Dana, c	Mic.		500,00			50 535,0	oo Ma	y. 18	63 0	50	000 No			00				**	1								
Dawson, s Duncan, s	Ont		1,200,00	60,00	0 2		oo Jul							1 4								****					
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Osceola, c	Mic	h	1,000,00	40,00	0 2	880,0	oo Ma	y. 18	76 21	00	000 OC			00													
Petherick, c Pewabic, c	. Mic	h	500,00			165,5	33 Ma	r. 18	76 o	4600	oo Ju	y 187	3 I	00					1					• • • •			
Phoenix, c	Mic	h	1,000,00	20,00	0 5	817,5	oo Sep	t. 18	70 3	20,	ooo Jan	1. 187	6 I	00		***											
Ridge, c Rockland, c	. Mic	h.	500,00	20,00	0 2	200,0	00			90,	ooo Fe	b. 187	5 I	00		****											
Star, C	Mic	h	500,00	20,00	0 2	265,0	oo Jai	r. 18	76 0	50																	
Superior, c	· Mic	h	500,00	20,00	0 2	340,0	oo Ma	1. 18	741 0	25							- 6										

6. Gold. 8. Silver. L. Lcad. c. Copper. \* Non-Assessable.

#### Copper Stocks.

Reported by Wilson W. Fay & Co., Room 7, 7 Building, 31 State Street, Brokers in Mining and Misons Stocks.

BOSTON, WEDNESDAY EVENING, Dec. 19, 1877.

There is an evident waking up in the market and a desire to invest shown by outsiders, which is having a favorable impression upon the stocks, running up the prices and creating a general good feeling, which looks like the forerunner of an active season in mining

outside orders are flowing in and everything indicates that the time to invest has arrived. Stocks that have remained quiet all summer are suddenly springing into life and showing a strength and firmness that could hardly have been expected after such a long project of constitute.

could hardly have been expected after such a long period of quietude.

Calumet and Hecla has had a slight decline, there being numerous transactions at 180, 179%, 179½, 178½, and closing 178½ (178½.

Copper Falls also declined and sold as low as 1½, but has strengthened again, and is now 2½@2½.

Franklin has been in demand, and, consequently, has shot up to 8½ bid and 9½ asked, there being sales at 8½ and 8%.

has shot up to 8½ bid and 9½ asked, there being sales at 8½ and 8¾.

Oscoola has also strengthened, closing 17@18.

Pewabic has not changed a great deal, although there is evidently more interest taken in it than there wassix months ago, and a rise may be looked for at any time. It closes 1½@1½.

Quincy is firm at 40@40½, and very little stock changing hands.

Ridge remains about the same, there being sales at 1¾, closing 1½@1½.

Dawson silver has been active, there being sales at 08 and 10. closing 08@10.

Dawson silver has been active, there being sales at '08 and '10, closing '08@'10.4 Duncan has taken a jump, having sold as high as 2½, and fluctuating between 2 and 2½ for two or three days, immense amounts of stock changing hands, the majority of which has been bought by parties who intend to hold, it being reported that a vein of silver had been struck, from which big things were expected. The market fell off to-day, however, and closes 1½@115-16.

International caught the infection from Duncan and went up to 45, but has also dropped off, and sold at '37½, closing '35@.37½.

at '371/2, closing '35@.371/2

#### Gold and Silver Stocks.

NEW YORK, Friday Evening, Dec. 21, 1877.

Gold and Silver Stocks.

New York, Friday Evening, Dec. 21, 1877.

Nearly the total weeks' business of the New York Mining Exchange has been confined to dealings in the stocks of the six companies in the order undermentioned. Kings Mountain Mining Co. N. C. This stock was placed upon the list on Monday. The mine is located 35 miles southwest of Charlotte, and has been worked a number of years. It has recently been organized under the laws of the State of New York with a capital stock of \$1,200,00 in \$10 shares. The sales for the week aggregate 18,400 shares, at quotations ranging from \$2 to \$2.50 per share, clesing at \$2%. Lacrosse has sold to the extent of nearly 16,000 shares, opening at 40 c. and closing at 28 c.—these prices representing the extreme quotations.

The dealings in Moose still form a prominent feature in the operations of the board, the sales amounting to 14,200 shares at from 7½ to 0.7%, closing at 7%. American Flag closes at 11c, with sales of 13,200 shares. The stock of the American Gold Mining Company of Colorado closes at 6½ per share, with sales of 6,300 shares; we refer to our Colorado correspondence for some information concerning this mine. Bertha and Edith has been fairly steady during the week, nearly 6,000 shares of the stock changing hands. The Idaho Gold Mine of Grass Valley, California, has paid its one hundredth or centennial dividend.

The Foot Hill Tidings says: "This mine commenced paying dividends to this time, the aggregate amount being \$2,270,820. Beside the payment of these dividends the mine has paid for the erection of costly hoisting works, a 35-stamp mill, and a fire-proof building for the pumping engines, air compressors, and all the improved apparatus used in mining. The main shaft is down over 1,000 feet, with levels well opened, and large reserves of ore in the stopes. The mine is looking well wherever opened, and gives assurance of continous dividends in the future; and as it stands to day is good for three or four years work to come without reference to developm

of the present condition of the market. So long as the brokers are the only ones who are making money, dissatisfaction will prevail, and we do not, therefore, look for a very speedy improvement under these circumstances. As the general trade of the city and coast is greatly affected for the want of rain to give us an assurance of a good crop of cereals, just at that ratio are all our speculative circles depressed, and until this fear is dissipated by a prolonged and heavy rainfall, we may look for a marked inactivity in all avenues of trade and commerce."

MINING STOCK QUOTATIONS IN SAN FRANCISCO.

We give below a table showing the closing prices of mining shares in San Francisco yesterday, 20th inst.

Alpha 1133	Mexican   163/
Belcher 6	Northern Belle 121/2
	Ophir55½
Bullion 7	Original Comstock
Caledonia 43	Overman 251/4
California 28	Raymond & Ely 8
Chollar Potosi42	Santiago
Con. Imperial	Savage 133
Con. Virginia	Seg. Belcher 39
Confidence 6	Sierra Nevada 5%
Crown Point 75	Silver City
Eureka 39	Silver Hill 3
Exchequer 5	South Comstock
	South California
Hale & Norcross 103	
Indian Queen	Trenton
	( Union Con 73
	West Belcher
	Yellow Jacket 113
Kossuth	Young America
Leopard r	1

The Gold Hill News of the 12th inst. says: "Ophir is quietly developing, as far as that new ore vein at the 1900 level is concerned, and in a week or two from now the new management will have the pumps in readiness for whatever water is likely to be encountered in case it should be deemed expedient to crosscut the ladge.

case it should be deemed expedient to crosscut the ledge.

"According to latest accounts from San Francisco, the rascally looking transactions in the old management of the Justice Mine, which are being brought to light, are proving worse and worse as further developed. A perfect lead or rich deposit of rascality is being unearthed by the new management which so suddenly and promptly stepped in to the rescue. It is shown according to the accounts of the old managers, that over \$3,000,000 worth of bullion has been taken from the mine in the last two years, and \$1,000,000 received from assess the rescue. It is shown according to the laccounts of the old managers, that over \$3,000,000 worth of bullion has been taken from the mine in the last two years, and \$1,000,000 received from assess ments; yet no dividends have been paid during that period. This has to be accounted for. The following telegram received by us from San Francisco is significant in this respect:

"Attachment suits against Shultz & Von Bargen have been commenced in the Fourth District Court, at the instance of the Justice Mining Company, to the amount of \$155,000. The attachments are now being levied on all the property of the firm.

"The Investigation Committee find the Woodville affairs in about as bad a condition as the se of the Justice, and they warn the public against purchasing Woodville stock, as an over-issue has been discovered, the amount of which is not yet ascertained."

Ontario Silver Mining Co.—The production of this company from the 1st to the 1st hinst. inclusive, was 50 bars of bullion having an assay value of \$88,911.06.

Northern Belle Mining Co.—The trustees of this company have concluded to omit the regular monthly dividend for December.

Sutro Tunnel.—This work is making very good advancement at present, through favorably working ground, consisting of ledge porphyry with seams of quartz and clay. Total length of tunnel, 18,478 feet.

Assessments, with dates when delinquent: Alameda toc. Jan. 23; Belmont 40c. Jan. 7; Silver Hill \$1, Jan. 5; Lucky Jack 5c., Jan. 12; General Lee 5c., Jan. 5; Alta \$2, Jan. 17.

The Tip Top Mining Co. has levied its second assessment of 40c. per share, aggregating \$40,000.

The Buluer Mining Co (Mono Co., Cal.) has levied an assessment of 50c. per share.

The Standard Mining Co. has declared a dividend of \$1 per share.

DECEMBER ASSESSMENTS.

The San Francisco Stock Report of the 14th inst gives

The San Francisco Stock Report of the 14th inst gives the following list of mining assessments delinquent this month, so far as made public:

valice. Superintendent rair has ordered the		Per.		Del.
Ophir Cross Cut to be started, which causes	Name. S	hare.	Amount.	Dec.
some excitement among speculators. The annual	Andes	No 25	\$25,000	13
meeting of the Gould & Curry mine stockholders was	Astor,	10	10,000	10
held yesterday: 84,000 votes were cast, Flood and	Atlantic Consolidated	25	25,000	5
Heydenfeldt controlled the election. An assessment of \$1 has been levied.	Cerro Gordo	10	10,000	3
	Consolidated Washoe	20	8,000	
The San Francisco Post says it learns on good au-	Crown Point Ravine	10	3,000	29
hority that the Chollar-Potosi Mining Company have	Dayton		25,000	14
decided to increase the capital stock five shares for	De Frees Mill	25	25,000	24
one, and to divide the property into two mines of 600	Deer Creek	10 00	10,000	12
feet each, one to be known as the Chollar, and the	El Dorado W. &. D. G	1 00	3,750	27
other as the Potosi, besides selling 200 feet to the	Enterprise Consolidated	15	4,150	22
Hale & Norcross Company.	Excelsior Deep Gravel	15	5,000	31
The Commercial Herald of the 13th inst, says of	Falcon		15,000	13
the market: "Considerable weakness is manifested at	Grand Prize West		10,000	14
present throughout the list, and this coupled with the unearthing of more or less crookedness in a number	Green Mountain		2,000	17
of companies, does not help the market to an advance	Henrietta		3,000	18
as all expected would be the case toward the close of	Hornet		25,000	
the year. The good time coming is yet apparently	Independence		210,000	3 5
very far off, and the outsiders generally are very sick	Justice		15,000	27
your out one outsiders generally are very sick	Jennie A. & D. R		23,000	-/

Loyal Lead	20	2,000	11
Mint	10	5,000	4
Modoc Consolidated	50	50,000	21
Moore's F. B. Gravel	25	11,250	29
New Coso	50	50,000	3
New England	10	3,000	31
New York Hill	20	6,000	10
Navajo	50	50,000	1
Overman	3 00	115,000	8
Pawnee	10	10,000	24
Rex Montes	4 00	12,800	17
Savage	1 00	112,000	11
South Navajo	10	10,000	15
Savajo	15	15,000	14
Union Gravel	1 00	3,000	10
Utah	2 00	40,000	17
Ward	15	16,500	17
Wall Street Quicksilver	10	5,000	21
William Penn	5	5000	24

Total.....\$1,065,650

#### Gas Stocks.

NEW YORK, FRIDAY EVENING, Dec. 21, 1877.

New York, Friday Evening, Dec. 21, 1877.

We are reported no change in the quotations of gas stocks, prices in every instance remaining as given in our last. The only transactions coming to our notice is a sale of 10 shares of the stock of the New York Gas Co., on the 18th inst., at auction, at 120 per cent.

Lighting the Streets of New York.—The Gas Commission, comprising the Mayor, Comptroller, and Commission of Public works, met at 2 o'clock in the office of the latter on the 15th inst. and adopted a resolution awarding a contract to the Harlem Gas Light Company for lighting all the public lamps, 4,220 in number, between Seventy-ninth street and Harlem river, at the rate of \$7.90 for each lamp, for the four months ending April 30, 1878. This award completes the contracts for the entire city for the above term. The rate paid the Harlem company for the corresponding term of 1877 was \$13.32 for each lamp.

The Gas Quistion in Easton, Pa.—The Free Press says: "We believe but one opinion prevails about the new gasoline lamps. They are generally voted a failure. The plain truth is, if our citizens want light at night they must use gas, even if it is a trifle more expensive."

The Pittston (Pa) Gas Company has reduced the

failure. The plain truth is, if our citizens want light at night they must use gas, even if it is a trifle more expensive."

The Pittston (Pa) Gas Company has reduced the price of gas to \$3 per 1,000 feet, commencing with the present quarter. Their winter supply of coal cost them less than formerly, thus enabling them to make the reduction. The company has nearly four miles of pipe in use and about 270 consumers.

The Sunbu: y (Pa.) Gas Co.—The Democrat says:

"The Borough Council and the gas company of this place are at loggerheads. The council concluded to pay the company only \$1 per month for each street light instead of \$1.50. The company will not stand the reduction, and we are constantly compelled to plod the streets in darkness. This is very dangerous to life in the localities where the sidewalks are as bad as they are on Third street, below Chestnut."

The Reno, (Nev.) Gas Co.. has fixed the price of gas at \$6 per 1,000 feet, a reduction of 25 per cent. from former rates.

Poor Economy of the Municipal Authorities of Reading, Pa.—The municipal authorities of Reading, Pa.—The municipal authorities of Reading have ceased lighting the streets of that city. Already one life has been lost, and the city mulcted in damages on account of its negligence in failing to keep its highways properly lighted; and now the doctors of the place are talking of "unanimously refusing to make professional calls after midnight, on account of the personal danger incurred in the present state of unlighted streets."

Jeffersonville (Ind.) Gas Co.—A new gas company is lighted streets

Ighted streets."

Jeffersonville (Ind.) Gas Co.—A new gas company is being organized in this place, with a capital stock of \$25,000. Many citizens have subscribed. This company will apply for a charter soon.

Metropolitan (N. Y.) Gaslight Co.—The annual meeting of this company will be held Jan. 14.

Peoples' Gas Co. of Baltimore.—150 shares of the stock of this company sold during the week at 14½@38 per cent.

per cent.

The following list of Companies in New York and vicinity sorrected weekly by George H. Prentiss, Broker and Dealer in Gas stocks, No. 30 Broad street, N. Y.

		1	D	ivide	nds.	Quo	tat'ne
Companies in New York and vicinity.		Par.	Rate per an.	Am. of last.	Date of last.	Bid.	As'd
Metrop.  " Certf. " Bonds Harlem " Manhat." Manhat." Srooklyn, B'klyn. Nassau, " Certf. People's, " Certf. " B'ds Metrop. " Certf. " Citizen's " Certf. Citizen's " Certf.	90,000 4,000,000 2,500,000 1,900,000 500,000 1,950,000 1,000,000 1,000,000 1,000,000 1,000,000	1,000 1,000 50 50 52 25 1,000 10 10 10 10 10 10 10 10 10	10% 7% 7% 88 15% 7% 5% 10% 7% 10% 7%	3 1/2 3 1/2	Nov '77 June '77 " " Aug. '77 Nov '77	100 120 131 100 102 95 210 165 80 	95 103 124 1335 103 100 215 175 85 100 85 100 123 102 85 100 123 100 123 100 123 100 100 100 100 100 100 100 100 100 10

‡ Paid irregularly.

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# 148th Auction Sale. 75,000 TONS SCRANTON COAL.

On FRIDAY, Dec. 28th, 1877.

NEW YORK, Dec., 1877.

THE DELAWARE, LACKAWANNA AND WEST-ERN RAILROAD CO. will sell, by Messrs. JOHN H. DRAPER & CO., Auctioneers, at the Company's Sales-room, 26 Exchange Place, corner of William Street, New York, on Friday, Dec. 28, at twelve o'Clock,

### 75,000 TONS OF COAL.

from the Lackawanna Regions, of the usual sizes, de-liverable at Hoboken, during the month of Janu-

liverable at Hodoken, during the lineary, 1378.

The sale will be positive; each lot put up will be sold to the highest bidder.

No Bids, in any form whatever, being made for account of, or on behalf of the Company.

The conditions will be fully made known at the time of sale.

TERMS—Fifty Cents Per Ton, payable in current funds, on the day of Sale, and the balance within ten days thereafter, at the office of the Company.

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### NEW AND IMPROVED Engraving Process.



Perfect Substitute for Wood Cuts.

### The Speaking THE TELEPHONE.

An account of the Phenomena of Electricity, Magnetism and Sound, as involved in its Action; with Directions for Making a Speaking Telephone. By Prof. A. E. Dolerar, its inventor. Small 4to. Cloth. Illustrated. 75 cents. This is a subject of much interest at present, and Prof. Dolbear's exposition of it will be welcomed. The author elucidates the phenomena of electricity, magnetism and sound, as involved in the action of the telephone; describes the workings of the speaking telephone, and gives directions for making one. The au hor is specially qualified to write on the subject, as he is the inventor of the telephone which he describes. His descriptions are plain, and are helped out by a dozen or more engravings.—[Boston Journal.]

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