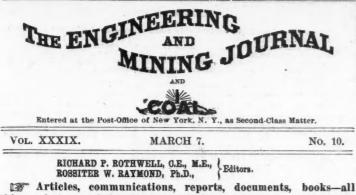
MARCH 7, 1885.



things whatsoever belonging to the Editorial Department, should be thus addressed : MANAGING EDITOR ENGINEERING AND MINING JOURNAL, P.O. BOX 1833, New York City.

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DR. PERSIFOR FRAZER, in his address as delegate from the American Association to the Royal Society of Canada last May, makes a happy allusion to the noticeable circumstance that "the dictionary of the people of the United States, so fecund in expanding itself to meet the wants occasioned by new conditions of things, has but one adjective to specify the nationality of our own illustrious men, which will apply equally to those of Canada-American." Strictly speaking, this application includes also the citizens of Mexico and the States of Central and South America; but general usage-among us, at least-practically restricts it to the two English-speaking peoples of this hemisphere, and fairly expresses the union of these two in literature and science, as well as personal friendly intercourse. In comparison with these things, political union is a matter of less importance, except as it might affect the conditions of trade.

THE Plymouth Consolidated Gold Mining Company, extracts from whose annual report are published in another column, is a brilliant exam- sent, have no more earnest and sincere friend and advocate than the

ple of a good mine under honest and efficient management. Organized June 1st, 1883, with cash on hand \$153,319.80, it has since produced \$1,714,008.65 (to January 1st, 1885), in gold; has spent \$541,158.75 in operating expenses; \$148,554.84 on construction account; has paid \$950,000 in dividends to the close of 1884; and had then cash on hand \$74,295.06. The company has paid or announced \$150,000 in dividends since January 1st of the present year. In 1884, the cost of mining was \$3.20 and milling 48 cents; cost of saving and reducing sulphurets 21 cents, making a total cost of \$3.89 per ton. The ore is low grade for a Pacific coast mine, the average yield being \$18 per ton. It would be satisfactory to know the average assay value of the ore milled and the loss in treatment, the percentage of sulphurets, etc. The management is in every way creditable and the record of the mine magnificent.

PROF. R. H. THURSTON, in his paper on Steam-Boilers as Magazines of Explosive Energy, read at the November meeting of the Mechanical Engineers, gives the amount of energy stored in the steam and in the heated water, respectively, for many different types of boilers, showing that the former is really insignificant in comparison with the latter. The common plain cylindrical boiler heads the list for latent destructive power, because it carries so large an amount of heated water for its weight. As Professor Thurston says: "Its simplicity and strength of form make it an exceedingly safe boiler, so long as it is kept in good order and properly managed; but if, through phenomenal ignorance or recklessness on the part of proprietor or attendant, the boiler is exploded, the consequences are usually exceptionally disastrous." Other forms, such as the Cornish, two-flue cylinder, plain tubular, locomotive, Scotch marine, and flue-and-return-tubular boilers, carry less destructive energy, but any one of them is a storehouse of enough to produce wide-spread disaster, The relative safety of the modern sectional boilers, water-tube boilers, etc., is due not merely to their carrying less available energy, but to "the division of their contents into small portions," and especially to "those details of construction which make it tolerably cer-tain that any rupture shall be local." A violent explosion can only come from the general disruption of a boiler and the liberation at once of its accumulation of steam.

WE confess it did not occur to us that the recent address of the Iron and Steel Association was to be looked upon seriously as a kind of "bull" of the popes of pig-iron ordering the faithful to have "confidence in the future of values" (whatever that may mean) as the "only one element necessary to secure a revival of business prosperity." And we did smile, where some of our heaviest producers of both iron and steel, to our certain knowledge, laughed outright at the picture of these "grave and reverend seigniors" in meeting assembled, the outcome of whose concentrated wisdom was an address "congratulating the American manufacturers of iron and steel and the country generally" upon the "apparent" "prospect" of an "approaching" "end of the depression in business." It must be admitted that this does border on the ridiculous ; but what apparently most troubles the supersensitive aggregated soul of the Association is our careless use of the familiar term "boom," to express the "business revival" that we supposed to be the object of the "bull." In the absence of an exact definition of the word in Webster, we may have applied too strong a term to the Association's bulletin, and its friends now utterly disclaim any desire for a "boom in the business" on the part of the iron men. In deference to this unexpected sensitiveness in the definition of words, we will attenuate our term to "boomlet."

But the little rhetorical introduction to the "address," which probably those who indited it laughed at, as did "the trade" generally, was harmless. The serious part of the address was the petition to the Senate and House of Representatives urging prompt and favorable action on "the adoption of a liberal policy in making appropriations" for just such things and those only, as would benefit one industry at the expense of others, and which from experience have been supposed by many to cover "jobs." The Association's organs can protest against wanting a "boom," and they can unjustly ascribe our remarks to "chronic hostility" to the great manufacturing interests of the country, or to ' animosity to the Association," which we have never felt, or to some mysterious and to us wholly incomprehensible "personal matter." But they have not a word to say in justification of the policy that we criticised, and with the wisdom of which we could not agree.

The best friends of "the great manufacturing interests of the country" are not those who ask for "liberal appropriations" for one branch of industry at the expense of all the others, but those who seek to bring about in all legitimate ways the permanent widening of our markets and the general adoption of economy, science, and skill in manufacturing, by which we may be able to compete with our rivals in the markets of the world. The manufacturing interests of the country, including that important interest that the Iron and Steel Association claims to repre-

ENGINEERING AND MINING JOURNAL, and we also appreciate highly the useful work done by the Iron and Steel Association in many directions, and have nothing but good-will toward it and its officers. That it occasionally is wrong, and that the ENGINEERING AND MINING JOURNAL in differing from it is in the right, has been proved in the past, and may be again in the future, to the benefit and increased prosperity of the manufacturing interests of the country in general and the iron industry in particular.

THE PROFITS OF GAS-MAKING.

A Senate committee that has been investigating our New York City gas companies has struck on a veritable bonanza, and the pay-chute continues without sign of exhaustion. It is very refreshing in these hard times to read of regular dividends of 25 per cent, with an occasional "extra" and a large reserve fund; but our admiration is greatly increased when we find these magnificent dividends are declared on stock that is largely "water" and in some cases was all "bonus," and never represented any "cash," the working capital being something, we might almost say, in general furnished by the sale of bonds.

The following are a few of the records as published in the daily papers

The Manhattan Gas Company was chartered in 1830, with a capital of \$500,000, \$320,000 of which was paid in, and the balance was returned in installments, presumably out of profits. In 1847, the capital was increased to \$1,000,000; in 1852, to \$2,000,000; in 1855, to \$4,000,000. The price charged for gas has pretty steadily declined from \$7 per thousand feet in 1836, to \$1.75 per thousand, the present price.

In 1874, the Manhattan Company made 377,500,000 cubic feet of gas, being at the rate of 10,352 feet per ton of coal used. The loss from leakage was 14.4 per cent; candle-power, 17.32. The cost of production, \$1.23 per 1000 feet. Selling price, \$2.50. By-products brought \$143,257. The company declared in 1875 35 per cent. For several years past, the company has produced over 1,300,000,000 feet annually. The return perton of coal has improved to 10,844 feet; the loss from leakage still aver ages over 14 per cent; the candle-power has improved to about 191; and the cost of manufacture at the meter has declined to about 66 cents and in the holder to about 50 cents per 1000 feet. The selling price for four years past has been \$2.25 per 1000 feet. The dividends, 25 per cent, with an extra 10 per cent when the company consolidated at the close of last year. The dividends for the past ten years have averaged over 21 per cent.

The New York Gas-Light Company was organized in 1823, with \$1,000,000 capital. In 1871, this was increased to \$4,000,000 by issuing four shares of new stock for one of old. " No cash was paid in." In the consolidation a few months ago, this company was put in at \$7,560,000. The works have now a daily capacity of 6,000,000 feet. The dividends paid were 20 per cent in 1875; 10 per cent in 1876 and 1877; 8 per cent in 1878; 4 per cent in 1879; 8 per cent in 1880 and 1881; 10 per cent in 1882 and 1883; 15 per cent in 1884; average for ten years, 10.3 per cent. In 1878, this company paid the Municipal Company \$300,000 for the right to make watergas under the Tessie du Motay patents, and has since used water-gas enriched by naphtha. In 1879, there was a war with the Mutual Company (which also made a water-gas).

The Municipal Company has been paying dividends at the rate of from 15 to 20 per cent on its capital of \$3,000,000.

A few points of considerable interest have been brought out. enormous increase of gas consumption and the more intelligent administration have reduced the cost of production in the past ten years from \$1.23 to about 45 cents per thousand feet, or a reduction of over 60 per cent. The cost to consumers in the same time was reduced 10 per cent. The dividends and the value of the property were increased.

WATER-GAS.

The companies that ten years ago denounced water-gas as highly dangerous to the public, and supported their absurd assertions by the reports of some of our well-known "professors," in order that they might defeat the introduction and competition of cheap water-gas, having in a great measure succeeded in this object, quietly themselves commenced the manufacture and distribution of the "deadly water-gas" that they had so long denounced. There are few people probably who know the progress made in the introduction of water-gas in the past ten years. Most of the Pennsylvania cities, Baltimore, New York, and several of our other large Eastern cities are now lighted to a great extent with an enriched water-gas; but the present enormous consumption will sink into insignificance when the cheap unenriched water-gas is distributed for fuel. The success of the new incandescent fuel gas-light, to which we have already made references in these columns, promises to bring about this change soon. We may then expect to see our gas, costing consumers say 50 cents per 1000 feet, used generally for fuel, and at the same time furnishing a much better light than we now have. Of all investments now before the public, gas-making appears to be the most profitable and the least liable to loss.

CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL, Replies not intended for publication should be addressed to the Editor of the ENGINEER-ING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

Calumet & Hecla Mill Notes.

EDITOR ENGINEERING AND MINING JOURNAL

EDITOR ENGINEERING AND MINING JOURNAL: SIR: At the Calumet & Hecla stamp-mills, at Lake Linden, Mich., considerable construction and alteration of plant are still in progress. At present, the Calumet mill is running four heads out of its equip-ment of five. Of these four, three are Leavitt heads and the other a Ball. One 15-inch cylinder Ball head is idle. At the Hecla mill, the southern addition to the mill is complete and the heads and washers are nearly all in. The Hecla mill now has seven Leavitt heads and two Ball heads. These two Ball heads will soon be replaced by an eighth Leavitt head. The mill is now running three Leavitt heads and one Ball head. The idea, we believe, will be to have twelve Leavitt heads in all at the

The idea, we believe, will be to have twelve Leavitt heads in all at the mills.

mills. Assuming the capacity of the Leavitt heads, taking the average of the two and four-way discharge mortars, to be 200 tons of rock a day, we should have a capacity of 2400 of rock a day, or 62,400 per month of twenty-six days, which would give 3700 tons of mineral. Even this is a little low, as the general run of the rock is about 6¹/₄ per cent of dry min-eral. But ten heads are to be used, so that taking a sixth from the above we shall have over 3000 tons of mineral a month. Considerable difficulty is had with the Leavittt sand-wheels. The Calumet wheel is the one on which the experimenting is done. All the old buckets have been taken out and replaced by plain straight Cornish ones; this has, in a measure, remedied the difficulty of discharge experienced in the original buckets, although there is still a tendency in the sand to pack in the bottoms of the buckets, and discharge when the regular top launder is passed. The latest difficulty, however, comes from the springing of the shaft. shaft.

shaft. The main shaft is about 14 feet across from pillow-block to pillow-block, and the rim of the wheel is stayed by 14-inch rods passing two hubs near the pillow-blocks. These diagonal braces, which are exactly in posi-tion and construction like bicycle spokes, are alternately subjected to a great strain and then to a compression sufficient to buckle them by the spring of the shaft. The rods that are at any moment above the plane of the shaft are loose and rattle, and those below are tightly strained. The consequence is, that they rattle and vibrate till the nuts holding them to the rim are shattered and they become loose. Rubber bearings were tried, but were soon abandoned. tried, but were soon abandoned.

The tie-rods have all been taken out and soft steel rods forged on the tire extremities, and in addition to that, the central hub has been strength-

tire extremities, and in addition to that, the central hub has been strength-ened by tranverse steel bars actuated in a ring around the axle, about two feet distant from the axle. These will tend to strengthen the hub and prevent the wheel sagging out of shape. An evident error in construction was the use of such a long shaft or axle. If the masonry supports for the bearings had been arched in the middle, the supply launders could have been conducted through them, and thus the width of the two launders. which now enter parallel with the plane of revolution of the wheel, could have been saved and the length of the axle reduced one half the axle reduced one half.

Civil vs. Military Engineers.

EDITOR ENGINEERING AND MINING JOURNAL: SIR: I think the time has arrived to say a few words in reference to Sin: I think the time has arrived to say a few words in reference to the control that military engineers have assumed of some of the fields that legitimately belong only to the civil engineer. This encroachment has grown to be as serious as it is undesirable and unjustifiable. Take, for instance, our river and harbor works : they are considered, by West Pointers, as an inheritance belonging exclusively to their self-constituted military aristocracy—an anistocracy quite ungenerous and overbearing, and having no right to its pretensions, either on the score of education are ability or by mesone of expediency or economy.

and ability or by reasons of expediency or economy. I propose to offer some proof in support of these statements, premising that my only object is to call a more general attention from outsiders to an abuse for which there is no necessity, which produces serious harm in many ways, and which can be easily corrected. First. As to the education of the West Point graduate. Does it fit him to take charge of the important civil works he endeavors to control?

His claim is based upon numerous specious arguments summed up as follows: Especial fitness through the high character of his education,

follows: Especial fitness through the high character of his education, economy, and European precedent. The education of the West Point engineer is exceedingly deficient, both in quantity and quality; and much inferior, for the purposes in question, to what is furnished, for similar purposes, by universities and colleges to civil graduates. The requirements for admission to West Point are very low—perhaps the very lowest in the country—and permit the entrance of cadets to West Point about one year less developed and one year more ignorant than the applicant to the Freshman class of our ordinary colleges. Since professional courses, as at West Point, are of four years' duration, it follows that the lieutenant of engineers has only three fourths of the total training of the civilian graduate of the same tour years duration, it follows that the neutenant of engineers has only three fourths of the total training of the civilian graduate of the same class standing. Let us now look into the quality of this fraction of his training, deducting from it, at the outset, about one year and seven tenths exclusively dedicated in West Point to military drill and routine. The operation stands thus:

Length of professional c	ourse	. 4.0 years
For insufficient entrance	preparation	1'0 year
For military routine		-17 years

Resulting available time for engineering training..... = 1.3 years (The above information is derived, approximately, from the West

Point Official Register.) We have, therefore, about one year and three tenths left, in which the military graduate must master all the literature, arts, and sciences tribu-tary to engineering; bearing in mind that he has been obliged to make up, inside of the class-room, one year of work that his civilian com-

petitor had mastered the year before he sought admission to college. But let us pass by, as if devoid of weight, the important advantage of greater maturity in the civilian; the effect upon his progress of broader and longer experience as a student; and the relation of these qualifica-tions to the breadth of his mental horizon. We will only compare the abstract quality of this 1°3 years of engineering education (with a mili-tary bias) at West Point, with four complete years of undivided attention to engineering in our technical schools. While the competition between the technical schools keeps them up to the times in meth-ods and results, the methods and books now in use at West Point were old, and in part discarded, when the writer was a student in Troy, twenty-eight years ago. We find in the last West Point *Register*, under the obsolete heading of "Natural Philosophy," that Bartlett's *Mechanics* is still the main pillar of the West Point engineering foundation. I fear, however, that very few West Pointers have found leisure, in their serious professional life, to put into working shape the generalities of Bartlett, preferring either to make original investigations, or borrow ready-made formulæ from the treacherous and large family of "Engineers' Pocket-Books." It is to be expected that if West Point has remained stationary in the work that forms the very life of the engineer-ing profession, it must be still more backward in subsidiary studies; and so, we find Fownes's *Chemistry* retained to this day in the class-room at West Point, when the student of Johns Hopkins, Harvard, Cornell, or Yale would look upon Fownes as an interesting evolution of alchemy. Yale would look upon Fownes as an interesting evolution of alchemy. The scientific isolation of West Point is further made apparent by the conservative pertinacity with which it has kept in use for a long series of years text-books upon a wide range of subjects, all written by a single author, and now far behind the times; while our best technical schools make a moderate use of text-books, for often they contain "old matter" by the time they are first put on sale. Believing these facts and their corollaries to be incontrovertible, upon

by the time they are first put on sale. Believing these facts and their corollaries to be incontrovertible, upon what, then, rests West Point's claim to superior technical education? Let us now pass to the general culture of our military cadets. Much of it belongs to the primary school. The courses in language appear quite elementary, as indeed might be expected, in view of the inade-quate preparation for entrance; and with such elementary work in military ethics, international and constitutional law as can be given in a crowded curriculum and as a soldier needs know for his restricted uses, the culture-giving studies of West Point come to an end. The absence of competition with West Point, the high character that must be expected from the military officers of this great nation, and the invidious comparisons that must be drawn with officers of other nations, demand the highest possible qualifications for admission to West Point. A cadetship should not be open to the abuse of being made the reward of Congressmen to wire-pulling farmers of his district, or by presidential custom made the inheritance of military families. Let us now investigate how the employment of military engineers affects the cost of civil construction. A young man leaving West Point with honors is entirely unfit to be

A young man leaving West Point with honors is entirely unfit to be placed, with authority, in charge of construction, not infrequently over experienced civilians, and under conditions that never obtain in the case of college graduates. Probably the nation has paid thousands of dollars in waste for every dollar's worth of the usefulness of some of these officers

A young graduate is never an engineer ; but the training received by him will readily tell upon his work. If properly trained, he contributes largely to the economy and success of his charge, and growsfast into use-fulness: otherwise, he is discharged and seeks other avenues for his livelihood. The West Point man can not be discharged, and is placed at once over a retinue of subordinates, thus intensifying the inevitable opportunities his inexperience will find to make blunders and cause waste, and his professional education becomes an expensive and long process. His ignorance is covered under supercilious military authority, and he becomes either a despotic nuisance in the work, or, as is more frequently the case, he leans upon his subordinates for the advice he pumps out of them in the guise of consultation ; and this pumping appears afterward in his "reports" as his orders to the civilians. The lat-ter, seldom, if ever, get due credit for their success. This military idio-syncrasy exists in all the countries in which the writer has worked under and over military men. It is difficult to understand why the government persists in spending A young graduate is never an engineer ; but the training received by

under and over military men. It is difficult to understand why the government persists in spending millions upon millions of money in our rivers through the hands of men neither technically nor practically trained for the purpose, neglecting the ability and superiority of experts trusted to do this work by the unanimous business experience of mankind. Another argument advanced by military officers for their retention on civil works is the precedent established by other governments. We must remember that European states live in a perpetual state of either armed neutrality or open aggressiveness, and support military establish-ments that their traditions and necessities render incompatible with our unmilitary system of national administration. Public works in Europe are often outlets for the occupation of superfluous employés and paupers; and military men, who are among the best educated men they have for

are often outlets for the occupation of superfluous employes and paupers; and military men, who are among the best educated men they have for the purpose, are sometimes the administrators of their terrible necessity. But strongly as expediency and need may demand, the military charac-terization of European public works—and this argument is not valid in this country—I find in this very argument reasons proving that Europe does not do these things from choice, and is rapidly restricting the scope of military engineering to its legitimate field, while civil engineers are more and more placed in charge of public works, and their high social status is becoming fully recognized. France established long ago the eminently civil school of "Engineers of Bridges and Roads," which now control all national public works, including canals and the light-house establishment. It may be proper to remark here that, while any student of the *École des Ponts et Chaussées* may enter the military schools without examination, students of the latter may not enter the civil school without advanced preliminary examinations. For years, France has used military engineers for war purposes only; and yet no nation can rival France in the perfection of her light-house arrangements, her wonderful system of internal naviga-tion, and the remarkable monuments of skill, boldness, and elegance erected by her civil engineers. erected by her civil engineers. The Ordnance Survey of England has been quoted as a successful mili-

tary precedent. Yet it contains only nineteen Royal Engineers in a roll of over eleven hundred civilians; while its military character has been sufficient to make this survey cost about six times more than the Swiss survey over much more difficult ground.

Taking into account the intensely cost about six times more than the swiss survey over much more difficult ground. Taking into account the intensely military character of Germany and the stress laid upon the strategic importance of her rivers and roads, it is remarkable that the public works done under the "Ministry of Com-merce" grow daily in importance and quantity, while the civil work under the "Ministry of War" is rapidly dwindling in importance, and no military engineer is employed in her rivers, harbors, and roads. Spain has, it is true, a "uniformed' civil organization, of quasi-mili-tary tendency, known as the Administracion Civil; but the military engineers, if we except the most distant colonies, have only military business on hand. Like France, Spain maintains a national civil school (Ingenieros del Estado) in charge of all public works; and such work as geodetic surveys of a high grade demanding very special training is done under the Geographical Statistical Institute. If a military man of great prominence is found here, it is on account of his fitness; not on account of his military rank. And the disbursements and financial transactions of this office, as well as those of military engineers doing civil work in the colonies, are controlled by the Administracion Civil. In Italy, the geodetic survey is in charge of the "Ministry of Spiritual, Educational, and Medical Affairs," although it is quite independent of it

Educational, and Medical Affairs," although it is quite independent of it and of military dictation.

and of military dictation. In Switzerland, this work is done by contract with civil engineers, under rigid specifications, at the usual rate of about \$16 per square mile. The military organization of England pays six times as much—18 pounds sterling—for a little better work. The triangulation done in this country by military engineers is, as near as Lean exception \$18 per wile will are done for the Stote of

as I can ascertain, \$18 per mile, while similar work done for the State of New York by Professor Gardiner costs only \$9.80 per square mile, and his limit of errors compares favorably with that of any European trian-culation gulation.

gulation. In view of the smallness of our standing army and the vast extent of our territory, why can not our officers be kept busy at their legitimate business, leaving the civil work in charge of civil engineers? The creation of a suitable bureau under some one of the government departments, placed under properly educated engineers and under a strict civil service plan, would give us the best substitute for the French system; and such a bureau would be a credit to this nation, and would contribute in many ways to the material progress of the country and the advancement of constructive art. advancement of constructive art.

advancement of constructive art. The present semi-educated military engineer is inimical to the civil engineers in this country—first, because he tries to monopolize a field that does not belong to him ; secondly, because he tyrannizes over a large number of civilian subordinates often superior to him in capacity and skill ; thirdly, because he under-pays them and deprives them of legiti-mate promotion ; fourthly, because he seldom gives them credit for the success they achieve, and which he cooly appropriates as his own ; fifthly, because he contributes materially to cheapen their labor, and conspires to lower their social status ; sixthly, and mainly, because he is a source of waste and professional and scientific demoralization that should exclude him from this field. exclude him from this field. I will add that I know and admire the ability of some of our military

I will add that I know and admire the ability of some of our military engineers, and recognize the uniform personal worth of the corps, which, in spite of their defective present education, has produced many eminent men. The grievance I seek to remedy rests upon high ground, and is not personal. I believe the military control of our civil works is an evil fast decaying and nearly at an end. The justice of the claims of the civil engineers, the numbers, influence, unanimity of purpose, and the telling blows already inflicted, will presently place the unfair military competi-tor at work in his legitimate field, where his achievements will be heartily applauded by his civil brother. Very respectfully, C. U. E.

OFFICIAL STATEMENTS AND REPORTS.

Iron Silver Mining Company, Leadville, Colo.

The report of this company for the year 1884 is not as satisfactory as could have been desired. The following is the financial statement :

Total receipts in 1884.		
Total expenses	\$961,577.52	
Dividend No. 13, paid January 9th, 1884		

The following is a statement of the assets and liabilities, as taken from the books of the company. The mining supplies, timber and stable accounts are inventoried at their cash value :

pe	ASSETS.	
for	Mining estate, mining plant, and permanent improvements\$10.	000.000.000
		84,461.61
ty.	Carbonate Bank stock	10,000.00
ac-	Bills receivable	4,500.00
in	Mining supplies	2,753.41
	Timber account	2,318.27
ppe	Stable account	2,512.11
ope	LIABILITIES.	

\$10,106,545,40 \$10,106,545,40

\$10,106,545.40 \$10,106,545.40 There were produced during the year 40,965 tons of dry ore, of which 15,046 tons were from company work and 25,919 tons from tributaries. The mining work done was : 1800 feet of shafts, 923 feet of rises, 707 feet of winzes, 12,156 feet of drifts, and 2194 cubic fathoms of stopes. The decline, nearly 30 per cent in the price of lead and about 6 per cent in the value of silver during the year, caused a decrease of about \$150,000 on the year's output, and caused also a reduction in the output. The Moyer shaft opened a large body of zinc lead sulphide ore, having an average aggregate value of the metals of from \$40 to \$50 per ton ; but there is no market for this ore at any figure that will pay to mine it. The remedy proposed is to put up concentrating-works and separate the galena

and blende, when each will have a value that will leave a fair margin for interest for which we have no room. We confine ourselves to a few

The prospecting-work was pushed extensively during the year, and resulted in opening what promise to be large bodies of ore; but on the whole, the year's work was unsatisfactory, and the stock of the company declined from \$2 to about 65 cents a share. Since the first of the present decined from \$2 to about 60 cents a snare. Since the inst of the present year, a large body of good ore has been opened; and in January, the profits amounted to about \$30,000. February reports are not yet in, but will show about as good results as January, we are assured. So that this property appears to be again upon the dividend road. We regret the omission in this report of the usual table of itemized cost of production, which should form a part of every such report. We shall hereafter publish monthly the full monthly report of the manager of the mine.

of the mine.

NTHLY REPORT OF THE IRON SILVER MINING COMPANY FOR JANUARY, 1885.

To balance	\$84.461.61
Ore sales	28,668,11
Trobute ore sales	33,377.22 \$146,506.94
Mining labor.	
Miniog supplies	582.69
Timber-labor	11.00
Stable-labor	140.30
Office and general expenses-salaries	916 66
Legal expenses-attorney's bills, etc	1,177.31
Hauling ore	178.27
New York office expenses	333.33
Tribute expense	25.215.64
Assay-offices	78.76

\$31,172.17 115,334.77 146,506,94

The Susquemanna Coal Company, the Mineral Railroad and Mining Company, the Summit Branch Bailroad Company, and the Lykens Valley Coal Company.

From the elaborate reports of these companies' proceedings, we extract

and tabulate the following interesting data. We commend this system of itemization of accounts to the Delaware & Hudson Canal Company, the Delaware, Lackawanna & Western Railroad, the Pennsylvania Coal Company, the Lehigh & Wilkes-Barre Coal Com-pany, etc., for their imitation : EXPENSES PER TON OF ANTHRACITE COAL.

Susque	channa	Min	eral	Sur	nmit	Val	ens lley
	Co.		. Co.		h RR.	Coal	
Outside: 1883.		1883.	1884.	1883.	1884	1883.	1884.
Insurance 0.34	0:32	0.46	0.12	0.24	0.53	0.28	0.57
Legal expenses 0.02	0.11	0.13	0.05		0.53		0.02
Live stock 1.44	1.76	2.31	2 47	1.87	1.49	4.84	4 08
Office expenses, rent, etc 0.13		0 56	0.66	0.31	0.31	0.37	0.35
Preparing coal 12.32	11.36	15.97	15.51	14.93	17.26	18.79	25.64
Repairs and gen'l expenses 6.63	6.99	18.16	17:53	9.86	12.01	21-27	20 44
Royalties 2.71		9.78	10.94				
Shops and repairs 0.21		274	2.56	2.37	2.67	1.18	0.93
Stable expenses 4.02		6.39	5.09	5.67	4 91	11.80	11 74
Stationery and printing 0.12		0.19	0.22	0.17	0.21	0.26	0.31
	0.801	0.19	0 44	011	0.41	0 20	0.01
		3.01	3.02	0.40	3.37	F.20	
Superintendence and cierks 1.87	1.85 (3.48		5.20	5.80
Taxes 1.09	0.98	2.37	3:22	1.15	1.61	1.54	1.70
Inside : Air an I gangways 4.04	3.28	20.59	15.67	20.68	23.08	16.21	26.49
Cars, slope, and drift 1.81	1.51	1.61	2.30	2.05	1.75	7.33	4.75
Cross-headings and chutes 3'37	3.25	8.85	7.88	6.55	6.60	5.39	10.65
						0.00	
Exhaustion of lands 7'78	7.56		2 00	4.13	3.81	01.04	40.40
Hoisting and pumping		4.23	5 03	9.65	8.67	21.84	18.40
Mining coal 50.90	49 52	53.17	49.94	48.84	46.49	60. 85	64.56
Repairs and gen'l expenses 31.79		25.78	26.40	48.98	50.97	75 15	76.68
Timber and props 6.10	7.22	10.81	11.21	9.66	8.18	23.53	26.76
Improvement and General:							
Breakers		1.31					
Cars		0.78	1.44	0.81	0.54	0.22	1.6
General improvements 12.15	20.20	15.55	18.80	7.26	3.58	19.05	29 16
Houses 12'10	10.92	0.94	1.85	0.43		0.03	0.16
Bairoad iron, ties, etc Slopes		4.23	3.74	1.02	1.29	4.04	5 51
Slonge		5.02	3.80				
Shope and talograph		0 09					
Total cost :		0.08	****	****	****		***
Av. cost per ton at mine \$1.50	\$1.43	\$2.15	\$2.10	\$1.98	\$2.00	\$2.99	\$3.36
Av. receipts per ton at mine \$1.85		\$2.07			\$2.85	\$2 50	
Tons produced : Susquehanna M. Co., 1883, 439.824 ; 1884, 4 364,545. Lykens Valley Coal Co	01,891.	Summi	it Branc			4. Mine 339,942 ;	
Sizes of coal shipped : -Pe	r cent	-Per	cent	-Per	cent	-Per o	ent
Lump 8:50		0.12	0.04			·	

Steamer			0.06	0.04				
Broken	9.40	9.80	4.45	1.29	9.10	8.60	14 00	13.30
Egg	13.70	14.20	15.86	14.03	22.40	23.30	16.80	17.90
Stove			39.00	37.58	27 70	26.30	25.50	23.80
Chestnut			22.50	25.14	17.00	17.90	17 00	13 70
Pea	12 00	12.40	18.01	21.92	17:30	15.20	13:50	21.60
Buckwheat		1.40			6.40	7.40	10.10	8.80
Culm		0 30			0.10	1.00	3.10	0.90

The above tabular statement, which we have compiled. brings together some very suggestive data. The cost of production has been reduced in the cases of the Susquehanna and Mineral Railroad companies, and has been increased in that of the Lykens Valley in particular, in which the preparation of the coal and the general improvement account are very large. The proportions of the different sizes of coal produced fluctuate some what with a tadement the general improvention of the coal large

what, with a tendency toward increase in the proportions of the smaller sizes. A few years ago pea, buckwheat, and culm were unknown; now we have pea forming in some cases 21.6 per cent of all the coal marketed. The following table shows the wonderful perfection which our mechanical preparation of coal has attained :

BREAKER-WORK IN 1884 OF THE SUSQUEHANNA COAL COMPANY.

Days worked. (10 hours.) Breaker No. 1	Tons put through. 199,021 15 442,298 10 150,372 14 506 630 19	Daily averages. Tons. Cwr. 664 04 1,482 12 537 12 1,711 18
Agregate daily production in 1883	1,299,323.18	4,396.06

Increased daily production in 1884 604.12 The reports give a vast amount of miscellaneous information of

extracts. The Susquehanna Coal Company charges the receipts with 10 cents a ton on all sizes above pea mined from freehold lands for a sinking fund, to offset "exhaustion." The real estate account is, therefore, steadily reduced.

reduced. The net profit from all sources equaled 52.22 cents per ton of coal pro-duced. The Susquehanna Company paid its usual dividend of 6 per cent, after providing for all charges. The Mineral Railroad and Mining Company paid 10 per cent dividend in 1884. The Mineral Railroad and Mining Company produced as an average 35.9 tons of coal per keg (25 pounds) blasting-powder used. The Summit Branch Railroad Company, 34:20 tons coal per keg of powder. The commissions paid for marketing coal by all these companies averaged 15:17 cents per ton, as against 15:24 cents in 1888. The percentage of loss and dirt at the Summit Branch mines was 28:3 per cent of prepared coal produced. The percentage of loss and dirt at the Lykens Valley Company's mines is given at 64:17 !!

rightonen constitueed tion mining company, current	
Gold bullion produced by the mines of this company for the year 1884	1,033,518.29 331,163.84
Profit. Twelve monthly dividends of \$50,000 each were paid,	\$702,354.45
amounting to	60,000.00
Surplus over operating expenses and dividends Add surplus on hand January 1st, 1884	\$102.354.45 44,559.96
Total surplus Expended in improvements.	\$146.914.41 72,619.35

Alland Call Western Co.

Cash on hand \$74,295.06 The cash on hand, \$74,295.06, is actual surplus, the company having no indebtedness whatever.

Indebtedness whatever. In stating the surplus at the above figure, no account has been taken of the large accumulation of material on hand for future use, which is all paid for, and the value of which might properly be added to the cash to increase the surplus. Likewise, may be mentioned an amount of \$16,513.56 due us from other parties for money advanced by this company to construct works for supplying water, and which is gradually liquidated according to contract. according to contract.

according to contract. This company was formed June 1st, 1883, by the consolidation of the Empire, the Amador Pacific, and the Plymouth companies; capital, \$5,000,000. The mines were well developed, and a considerable amount in dividends had been paid. Prior to the consolidation, gold bullion to the amount of about \$2,500,000 had been produced. The following is a statement of all the receipts and expenditures of this company from its organization, June 1st, 1883, to January 1st, 1885, a period of nineteen months.

a period of nineteen months:

Less net indebtedness of Empire Company 5,466.1	11
Cash on hand at time of organization of this company	\$153,319.80
Gold bullion produced by the mines, 1883 and 1884	\$1,714,008.65
DISBURSEMENTS.	
Operating expenses. \$541,158.75 Construction 148,554.84 Nineteen dividends of \$50,000 each. \$50,000.00	
Cash on hand, January 1st, 1885	\$74 295.06

OPERATION, 1884.

During the year, both mills have been run with regularity, crushing in the aggregate about eighty thousand tons of ore. The average yield of gold was thirteen dollars to the ton. Deducting from the operating expenses the value of material on hand, and unusual outlay in recon-structing Empire Mill, etc., the cost of production is shown to be as follows:

Cost of mining Cost of milling	\$3.20 48	per	ton.	-
	\$3.68	6.6	6.6	

Total average cost \$3.89 " "

Water-power has been substituted for steam, and will hereafter run Water-power has been substituted for steam, and will hereafter run all the machinery on the property, including the two mills and the hoist-ing apparatus. The water is supplied from our own canals, except that used in the Pacific Mill, which is furnished with power under an old contract with the Amador Canal Company. Steam connections have been retained at the shafts, so that, in the event of accident, a change could be made from water to steam at an hour's notice. The introduction of water-power will effect a very large saving in computing company.

The introduction of water-power win check a tray large operating expenses. The Prospect tunnel running south from the Pacific shaft, on No. 2 level, has made large progress. On the 31st of December, 1884, it had been run to a point 527 feet from the shaft. Small bodies of ore have been found, but nothing of consequence. The superintendent expects to encounter the large chimney of ore believed to exist on the Indiana claim before the close of the year 1885. Sinking was begun again at the Pacific shaft December 31st, 1884, with

Sinking was begun again at the Pacific shaft December 31st, 1884, with the view of opening another level. The superintendent writes that the next lower level will be better in quality, and probably larger, than any preceding.

preceding. Machinery is also getting into place for the sinking of a shaft on the Woolford at a point about 600 feet east of the north shaft of the Empire. The shaft will be sunk on the vein, and there is good reason to believe that a valuable deposit of ore will be uncovered. The property of this company is located in the town of Plymouth, Amador County, California. The company owns land a mile in length (lacking four hundred feet) on the line of the mother lode, with a width varying from 500 feet to more than a quarter of a mile. The principal mine consists of an immense chimney of ribbon quartz,

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from thirty to fifty feet wide, and from 815 to 450 feet long. The ore mills freely, and contains from one to two per cent of sulphurets. There are three shafts—the north and the south, both of which follow the vein, and the Pacific shaft, which is vertical. The latter has three compart-ments, two of them 5 by 4 feet and the third 5 by 3½ feet, the excavation being 16 by 7 feet, carefully timbered with 12 by 12-inch and 12 by 14-inch pieces. This shaft is equipped with superior hoisting machinery. Self-dumping automatic skips are used, hoisting three thousand pounds of rock each, with English flat wire cables. The derrick frame is 76 feet in hight. in hight

On the Pacific claim, the levels are as follows :

No. 1 is 1060 feet below the surface. " 2 " 1157 " " " " " " " 3 " 1237 " " " " " "

Level No. 5 will be opened during the coming summer. On the Empire, the levels are designated according to their depth. The lowest, denominated the 1280 level (the measurement following the north and south shafts, which incline), is about 1100 feet vertical.

south shafts, which incline), is about 1100 feet vertical. The temperature of the mine is moderate. Very little trouble is experienced from water. No pump is needed. A bucket running a few hours each day keeps the mine clear. Our two mills have an aggregate of 120 stamps, and are located about one thousand feet apart. The Empire mill has eighty stamps, and the Pacific forty. The latter are the heavier, weighing 900 pounds each. Both mills are in excellent condition, and together are crushing about 250 tons of rock daily. Connected with the mills are forty Frue concentrators for saving sulphurets.

tained as formerly, en-abling the company to make its own re-pairs. Every depart-ment has been conducted with economy

and exactness. All material, timber, machinery, etc., are purchased at net

cash prices. The company owns extensive water-works. In addition to the several reservoirs, there are canals as follows

MAIN .-- Twenty-five MAIN.—I wenty-five miles long, runs from the middle fork of Cossumnes River to Plymouth.

SOUTH FORK. or BRIDGEPORT. - Twen ty miles long, runs from main fork of the Cossumnes to a point one mile northeast of Plymouth, where it joins the main canal.

SIMPSON.— Twenty-two miles long, runs from the south fork of the Cossumnes River to the reservoir, 24 miles northeast of Plymouth.

residence. It is in the foot-hills of the Sierra Nevada, 900 feet above the a, comfortable in summer, and not too cold in winter. This company is now paying larger dividends than any gold mine in orth America

The mines are looking better than at any previous period of their history

This company now produces annually about seven and a half per cent of the gold output of California, about three and a half per cent of that of the United States, and about one and one eighth per cent of that of the world.

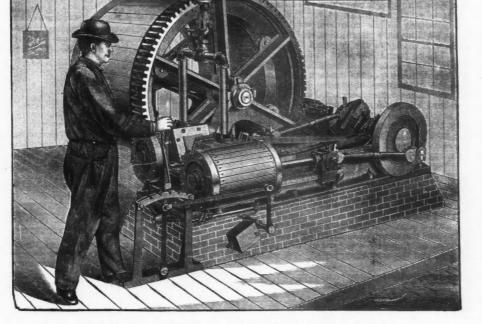
IMPROVED DOUBLE CYLINDER HOISTING-ENGINE.

IMPROVED DOUBLE CTLINDER HOISTING-ENGINE. The Morris County Machine and Iron Company, of Dover, New Jersey, represented in this city by Messrs. Graydon & Denton, 15 Cortlandt street, has brought out this new claimant for the first place among hoist-ing-engines. The two cylinders stand on a single bed-plate, and for compactness, simplicity, and accessibility of the working parts, this engine appears to be well designed. Among the claims of superiority made by the manufacturers are, that the moving parts are directly under the eye of the engineer; the brake-lever and throttle-valve are within his reach, and he can see past the end of the drum to the landing from which signals are made. The engines are built strong—steel cranks, steel rods, steel links, etc. The pinion for a geared drum is on the end of the crank-shaft close to the long out-bored bearing. The drum-frames are separate from the engine-bed, and what strains the drum is subject to can not affect the alignment of the engine proper; and if, as some-times happens, the machine is no longer required for hoisting, the drum may be removed, leaving the engine free to be employed for any other purpose—a feature of value in itself. The company makes several sizes; and for fast hoisting in cages, the for saving sulphurets. We believe the Pacific mill to be one of the best equipped in exist-ence. The company's chlorination works, recently constructed, have shops have been main-tained as formerly, en-

cal and grooved for the rope; but the larger drums for ordinary heavy loads are geared as shown, and are lagged with wood.

SIDNEY GILCHRIST THOMAS.

Mr. Thomas died at Paris on Sunday, the first of February, and was buried in Passy Cemetery on the fol-lowing Tuesday. He was born in London, in April, 1850. When he was born, the whole quantity of steel made in the world was less than thirty million tons. Mr. Thomas tons. Mr. Thomas died hoping and believing that the pres-ent year would wit-ness the production of over a million tons of basic steel alone. So absorbed was he in the work he had set him-self to do that the approach of death itself could not deter him



IMPROVED DOUBLE CYLINDER HOISTING-ENGINE.

Plymouth.Set to uo that the approximation of the state of

request to his relatives was, that they should not be asked to take another winter journey on his account, and to lay him where he died. Many are the monuments of his genius, and many are the friends who will feel his loss.

QUICKSILVER REDUCTION AT NEW ALMADEN. *

By Prof. Samuel B. Christy.

The mines of New Almaden were opened some years previous to 1850. The regular workings of which records have been kept extend from that

The regular workings of which records have been kept extend from that date to the present time. During the thirty-four years ended with 1883, the quicksilver product of these mines has been exceeded by that of Almaden in Spain only. During this period, the yield of New Almaden has been 79 per cent of that of its namesake in Spain, three times that of Idria in Austria, and greater than that of all the other mines in the world put together. Very little, however (almost nothing, in fact), has ever been published regard-ing either the mine or its works. These facts, together with the energy with which improvements have been introduced and perfected at New Almaden, particularly during the last ten or twelve years, justify the length and detailed nature of the present paper.

present paper. This study of quicksilver reduction will consider :

The ores : their sorting and classification. Methods of reduction : historical sketch. Reduction-works : their situation and arrangement. 3.

4. Furnaces: their construction, mode of operation, and economic result

a. Intermittent furnace. b. Continuous coarse

Continuous coarse-ore furnaces. Continuous medium-ore (granzita) furnaces.

d. Continuous fine-ore (tierra) furnace

I. ORES. SORTING AND CLASSIFICATION.

As is well known, the ore at New Almaden is cinnabar. Native quick-silver occurs also, but, as a rule, in small quantities only. Pyrite occa-sionally accompanies the ore. Bitumen is quite common, sometimes as a fragile black lustrous solid, resembling soft bituminous coal, but melta fragile black lustrous solid, resembling soft bituminous coal, but melt-ing easily like tar : at other times, it occurs in the vuggs of the gangue, in a liquid state, like coal-tar. I have found lumps of apparently pure cm nabar from New Almaden to give a voluminous residue of pulveru-lent charcoal, when subjected to sublimation out of contact with the air. This would seem to show that the bituminous substance is intimately associated with the cinnabar. The latter occurs associated with a gangue of serpentine, dolomite, and a hard chalcedonic or soft chloritic "vein-matter." Very rarely the ore is found disseminated in sandstone. The "vein-matter," just as it is broken in the *labores* or stopes of the mine, is run out in ore-cars on an elevated tramway above the *planilla*, or dressing-floor, belonging to each center of production. At the Randol *planilla*, for instance, this tramway is 14 feet 6 inches above the dressing-floor.

floor.

noor. Beneath these tramways, at convenient intervals, are placed bar-screens inclined at 45 degrees. The bars, slightly chamfered at the bottom to prevent choking, are placed from an inch to an inch and a quarter apart. To prevent spreading, they are stayed with iron cross-bars at intervals of 4 feet. Their total outside width is 5 feet. Upon these screens, the ore is dumped, and what passes through is sheet. Upon these screens, the ore is dumped, and what passes through is known as *tierras*. The coarse fragments that fail to pass the screens are carefully examined, and any lumps that show signs of cinnabar are broken by hand to a maximum diameter of 9 inches, and the waste is rejected. The picked ore is known as granza. During 1882 and 1883, the totals from the mine were as follows :

-TODS OF 2	000 lbs. av
1882.	1883.
German metanial Water rock from vein, rejected45.097.08	44.147.20
Coarse material. Water rock from vein, rejected45.097'08 Coarse ore (granza)	9.584.20
Screenings. Fine ores (tierras)	20,289 24

Total product from ore-chambers.....

diameter of 6 inches

The product of the old dumps for the last two years is as follows :

	-Tons of 2	2000 lbs. av	
	1882.	1883.	
Terrero	322	261.27	
Tierras	.9,522	10,953.05	
Total viold	0 844	11 914-99	

⁶ A paper read at the Philadelphia Meeting of the American Institute of Mining Engineers, September, 1884.

The same ore-product is, therefore, classified somewhat differently at the mine and at the works. Thus:

(New mine	Granza, coarse (rich).
At mine	(Terrero, coarse (poor).
At works	[Granza, 6 inch-3½ inch (rich).] Terrero, 6 inch-3½ inch (poor). Granzita, 3½ inch-1¼ inch (poor). Tierras, 1¼ inch-dust (poor).
It will be obcoursed that at the ment	and distinction is made bet

It will be observed that at the works no distinction is made between new mine and old dump granzita and tierra ores. The general effect of a heap of granza ore with a light green back-ground of serpentine and "vein-matter," lighted up by bright masses of cinnabar, is quite pleasing to the eye. This class of ore usually runs at present from 6 to 8 per cent metallic quicksilver. The terrero has much the same composition as the granza; only its exposure to the weather on the dump has given it a dull, rusty look, and its quicksilver content is not more than from 1 to 2 per cent

exposure to the weather on the dump has given it a dull, rusty look, and its quicksilver content is not more than from 1 to 2 per cent. The *tierras* and *granzitas* vary, according as they come from one or the other of the above classes of ore, from a dull green to a rusty earthy appearance. Fragments of cinnabar are easily detected by the eye in some cases, and in others only by panning. Their quicksilver content usually averages from 1 to 3 per cent. The total product of the mine for the last two years, classified as above explained, was :

explained, was :

	-Tons of 20	00 lbs. av
	1882.	1883.
Granza	9,236 43	9,584.20
Terrero	322.00	261.27
Tierras	24,657.81	31,242 29
Totals	34,216.24	41,087.76

The total amounts treated at the reduction-works for the same periods were :

		-Tons of 20	00 lbs. av	
*	Granza. Terrero Tierras and granzita	297.60	$1883. \\10,428.40 \\185.35 \\27,967.50$	
	Totals		38,581.25	

The differences between these sums total and the product of the mine s, of course, accounted for by the ore left over in the ore-bins.

The ore on hand at the reduction-works for the end of these periods vas :

	Tons of 2	000 lbs av
	Dec. 31, 1882.	Dec. 31, 1883,
Granza	1,265.990 .	421.790
Terrero	195.375	271.295
Tierras and granzita	2,3: 0.378	5,605.162
Totals	. 3.791.743	6.298.247

The granza and the tierras are weighed on platform-scales as they leave the planilla; the terrero and tierras from the old dump are esti-mated by volume. At the works, the granza only is weighed; the granza screenings, granzita, and tierras are estimated by volume. The latter, by experiment, weigh about 85 pounds per cubic foot, or 23.5 cubic feet ton.

It is evident that more than two thirds of the total product of the mine is in the form of smalls. The method of treatment must, therefore, be adapted to this fact.

II. METHOD OF REDUCTION.

HISTORICAL SKETCH.

The above account of the nature of the ores in mind, the following sketch of the gradual development of the methods now in use will be more intelligible.*

The first attempt at quicksilver reduction was made by treating the ores in whalers' trying-vats. These were made into retorts by luting on iron covers; but so much salivation of the men resulted from their use that they were soon abandoned, and regular iron retorts were introduced instead. The retort process necessitated crushing all the ores, in order to mix them with line, and was so expensive that only the rich ores would pay for treatment. As a consequence, concentration by washing or a total rejection of the poorer ores was necessary, in either case giving rise to considerable loss. Hence, even before 1850, attempts were made to treat all the ores, as was then done at Idria, Austria, and at Almaden in Spain, by roasting them and condensing the quicksilver from the prod-ucts of combustion.

The first furnaces built were badly constructed, with poor materials, and gave rise to the loss of much metal in the foundations. But experi-ence soon led to the type of intermittent furnace afterward widely used in California. One of these furnaces, known as No. 6, is still in use at New Almaden, and, with the other furnaces now used, will be described in detail later on.

This furnace was a great improvement on the old retort system. It was also an improvement on the intermittent furnaces then in use at Idria and Almaden; for the ore was supported by a solid floor and not by arches attacked from below by the full force of the flames. It had, however, all the disadvantages common to discontinuous furnaces. In the treatment of quicksilver ores, the dislocation of furnace and condenser treatment of quicksilver ores, the dislocation of furnace and condenser walls, resulting from sudden changes of temperature, was particularly injurious. The quicksilver escaping, both as liquid and as vapor, from these openings, caused both loss of metal and injury to the men. But the most serious disadvantage was the difficulty of treating the fine ores in these furnaces. The *tierras*, forming, as we have seen, the greater part of the product of the mine, had to be mixed with clay and made into sun-dried bricks, locally called *adobes*, the fore they could be roasted

* Most of the standard works on metallurgy state that quicksliver is reduced at New Almaden in retorts. This was once true : but, as nearly as can be now learned, has been abandoned since 1850. Retorts were used at the Enriquita Works later, till 1858 or 1860, for ore-reduction ; at New Almaden proper (the *hacienda*), they were used atter 1850 only for making assays or tests with rich ores. Since 1860, they have been entirely abandoned. The standard authorities are thus more than twenty years behind the times. * The adobes were made in wooden frames by hand, just as bricks are made; the frames forming six at a time. The molds were 4½ inches by 5½ inches by 10½ inche inside measure; the sun-dried adobe weighed about 12 pounds. In 1875, the cost of making the adobes was 50 cents per ton, and that of handling them afterward, drying, etc., 45 cents per ton. Total additional cost of treating *tierras*, 95 cents per ton.

MARCH 7, 1885.

IRON CLAD SHAFT FURNACE

at all in the furnaces then used. As the *tierras* from which the adobes were made were poor ores, the expense of making them largely reduced the profit of treating these ores. The next important improvement was the introduction of the con-

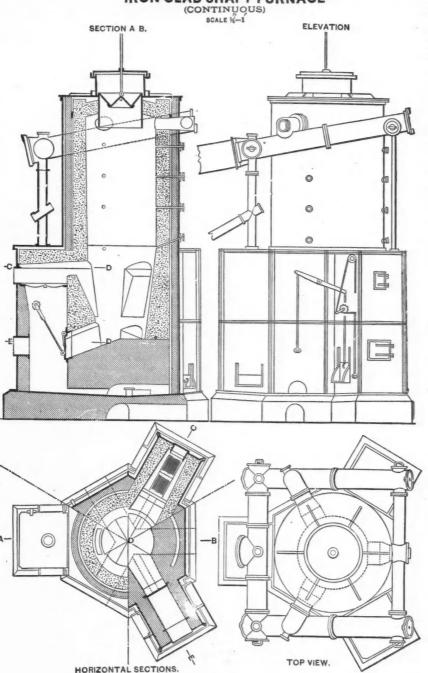
The next important improvement was the introduction of the con-tinuous coarse-ore furnace. This furnace was first invented and built for burning lime near Berlin by the celebrated Count Rumford.^{*} It was first introduced at Idria, Austria, by Bergrath Adolf Exeli, in 1871, and proved so effective there that its introduction at New Almaden followed in 1874. The first furnace worked so well that a second was built in 1875. These furnaces, locally known as Nos. 7 and 9, are also called "moni-tors," in allusion to their shape and to the fact that they are iron-clad. With the introduction of these furnaces, the economical treatment of the coarse ore was satisfactorily accomplished. But the most serious problem yet remained. Two thirds of all the ore had still to be worked into adobes, whether it went

adobes. whether it went through the monitors or the intermittent furnaces. The fine ores of Almaden in Spain are even yet made into adobes, while at Idria, Austria, this class of ores is treated in continuous reis treated in continuous re-verberatory furnaces (Fort-schaufelungsöfen). At New Almaden, the problem has been solved in a much happier manner by the in-vention of the Hüttner and Scott furnace Scott furnace. This must be regarded as

the most important con-tribution to the art of quicksilver reduction that has originated at New Almaden. The inventors Almaden. The inventors of this furnace are Mr. H. J. Hüttner, the well-known mechanical engineer, who devised nearly all the details of the various furnaces of of the various furnaces of this type, and Mr. R. Scott, the furnace-mason at New Almaden. To the careful and patient experiments of its inventors and of Mr. J. B. Randol, the manager of the mine, who introduced several important improve-ments of his own, the prac-tical success of this furnace

is due. The general idea of this furnace is similar to that of the Hasenclever - Helbig shelf-furnace. In common with the latter, it utilizes a series of inclined shelves, placed in the opposite walls of a narrow vertical shaft, to retard the descent of a column of fine ore. But column of fine ore. But it differs from the Hasenclever type in combining a number of ore-chambers in the same structure, and in the devices for regulating the passage of the products of combustion and for effecting the discharge.

effecting the discharge. The original experiment-al furnace, No. 5, contained two high, long, and nar-row ore-chambers, separat-ed by pigeon-hole walls from the fire-place on one side and the vapor-cham-ber on the other. From each wall of the ore-cham-bers, projected tile-shelves, placed alternately in the opposite walls. These shelves were inclined at an angle of 45 degrees to the walls, and each shelf was therefore perpendicular to



enough; but the escaping vapors were still quite hot, and the consump-tion of fuel was considerable.

To render the furnace more economical of fuel, to confine the greatest heat to the bottom of the furnace, so as to secure the thorough roasting heat to the bottom of the furnace, so as to secure the thorough roasting of the ore, and to allow the vapors to escape to the condensers just above the boiling-point of quicksilver, was the next object. All the above improvements in the working of the furnace were effected by placing arches across the vapor-chambers and over the fire-box, so that the air and fumes were compelled to make four passages across the furnace on their way to the condensers. First, the air that entered the fire-place was drawn through the roasted ore, thus absorbing its heat and remov-ing any quicksilver vapor that it might contain. Next, the hot products of combustion passed through the nearly roasted ore, thus imparting to it a maximum temperature ; and, finally, they were passed again back and forth through the cold-er ore in the upper half of

er ore in the upper half of the ore-chamber. In this way, the excess of heat was way, the excess of heat was imparted to the cold ore, and the fumes left the fur-nace for the condensers only moderately heated above the boiling-point of quicksilver. With these changes the furnace was quicksilver. With these changes, the furnace was found to do uniformly good work at a small expendi-ture of fuel and labor; and

ture of fuel and labor; and in this form, it was patented by Hüttner and Scott, October 31st, 1876. The capacity of No. 5 was at first only 6 tons per twenty-four hours. It was afterward increased to 12 tons; but it was evident that the full economy of the that the full economy of the new furnace could only be new furnace could only be attained when it was erected on a larger scale. Consequently, in the same year, 1876, a larger furnace, No. 8, was erected. This was a double furnace, two furnaces similar to No. 5, but larger, being united end to end in the same structure. It was origi-nally supposed that one of these might be repaired while the other was in use. Experience has shown the heat to be too great to allow this; and they are now always used together without inconvenience. In 1877 and 1878, a new

In 1877 and 1878, a new furnace, No.3,* was started. While this furnace was of the same type as its pre-decessors, its capacity was still greater, and it differed in having three pairs of orechambers placed side by side, and all heated by the same fire-place. Another modification was introduced in the middle pair of ore-chambers. These were made with a 5-inch shelfslit, and were to be used for roasting granzita; but it was found that the temperature best adapted for roasting *tierras* was not suited for *granzita*; and *tierras* only are now treated in all the chambers of this furnace

Furnace. Finally, in 1879, a new furnace, No. 2, with two ore-chambers, having an 8-inch shelf-slit, was intro-

therefore perpendicular to the next lower one in the opposite wall. The distance from the edge of one shelf to the face of the next below it was

distance from the edge of one shelf to the face of the next below it was three inches, thus forming an aperture through which the ore could pass. This aperture I shall call, for convenience, the *shelf-slit*. When fine ore was fed into this ore chamber through a hopper at the top, it ran from one shelf to the next, until the column found support upon the discharge apparatus at the bottom, whereupon the whole column came to rest throughout the structure. Thus the shelves of the ore-chambers were kept covered by an irregular zigzag column of ore. The end-walls of the chamber were pierced with pigeon-holes, so that the flames might pass from the fire-place under each shelf and over the ore lving upon the shelf beneath, to a vapor-chamber on the opposite end ore lying upon the shelf beneath, to a vapor-chamber on the opposite end of the ore-chamber. Thence they passed to the condensers. In the first experimental form, the flames made only one passage across the ore-chambers. The furnace, as thus constructed, roasted the ores well

* Described in Karsten's Archiv für Mineralogie, Geognosie, Bergbau und Hütten-kunde, 1837, pp. 645 to 702.

between granza and tierras. The granzita, it will be remembered, runs from 31-inch down to 11-inch diameter. In 1880, a second granzita fur-nace, No. 1, was built with two pairs of ore-chambers. With the above improved furnace plant, the economical treatment of fine and medium quicksilver ores may be said to be accomplished.

quicksilver ores may be said to be accomplianed. In the early history of the mine, according to most accounts, the con-densation of quicksilver was very imperfectly effected. Prof. W. P. Blake, in a letter to Prof. J. D. Dana,[†] dated February 14th, 1858, speaks of the loss of mercurial fumes escaping from the chimneys, and of "the peculiar gray coating upon their tops." An article in the American Cyclopadia, some ten years later, speaks of the salivation of men and animals about the works, and "the deposit of mercurial soot upon the

roofs around." During the last ten or twelve years, while improvements have been

* Most of the furnaces at New Almaden are built on the sites of old intermittent fur-naces, and retain their numbers as a survival. To avoid confusion, the designations used at the works are retained in this paper. † American Journal of Science, vol. avii., p. 438.

going on in furnace construction, constant attention has been given to the subject of condensation. The various devices that have been found most successful will be considered under the head of condensers on another occasion.

III. REDUCTION-WORKS.

SITUATION AND ARRANGEMENT.

The beautiful spot occupied by the *hacienda* or reduction-works is familiar to many California travelers. It was chosen in the early history of New Almaden. The road leading to the mine leaves the San José Valley, and, turning to the south, enters the cañon of Los Alamitos Creek. The handsome residence of the manager and the neat village of the officers and the workmen make a pleasing picture to the east of the well-shaded road. This latter is cooled by a running stream, a lurury all too rare in California summer. Luct above the village the a luxury all too rare in California summers. Just above the village, the narrow cañon widens out to an area of a dozen acres, giving barely room

for the reduction-works. The summit of Mine Hill is a mile to the west of the *hacienda* in a direct line, and thirteen hundred feet above it. A fine wagon-road, three miles in length, and a shorter tramway with self-acting inclines, serve to bring the ore from the mine to the works.

to bring the ore from the mine to the works. The ore-tramway from the mine enters the works at the top near the middle. It is situated at the foot of the tall bluffs behind the furnace, at a hight of 60 feet above the furnace-floor. Thence, the ore is dumped into the ten chutes arranged along the sloping sides of the bluff at an angle of 40 degrees. These are arranged with bar or cast-iron screens, as before described, to separate the *tierras* from the *granzita*, and have in most cases aprons of hanging logs, to retard the descent of ore and facilitate the removal of smalls.

Tacinitate the removal of smalls. The granza and terrero go directly from the chutes to the furnaces; but as there is not storage capacity enough in the chutes for the *tierras* and granzitas, the latter are distributed by elevated tramways to the ore-sheds, arranged at convenient points in the furnace-yard. It is necessary to accumulate during the summer months a stock of these ores to last through the winter, as they would be too wet to roast if exposed to the rains. This is all the more necessary, since they already contain considerable moisture and must usually be dried before already contain considerable moisture, and must usually be dried before

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bottom, from which nearly constant slender streams of quicksilver flow during the regular working of the furnaces. The metal is allowed to accumulate in large iron vats, whence it is weighed out into flasks, bottled and stowed ready for shipment. The product of each furnace is recorded separately. After passing through the condensing system attached to the furnace in which it is produced, the smoke is conducted to brick towers. In these brick towers, auxiliary fire-places are placed, to heat the side-hill flues in case of insufficient draught. The side-hill flues lead to tall brick chimneys on each side of the creek, which serve to dissipate the prod-ucts of combustion.

ucts of combustion. The spent ore or waste, locally termed "slag," is drawn from the cooling-pits of each furnace into cars, whence by tracks it is dumped into Alamitos Creek, which effectually disposes of it. Owing to the lack of sufficient level space for stowing ore above the furnace-heads, three elevators are used to lift the *tierras* and granzitas from the floor of the works where they have been stored (or dried in the sun during the summer) to the top of the furnaces. Two of these are water-balance elevators, while the other is a water-pressure elevator with picton with piston.

The furnaces, condensers, and ore-floor are toofed over; but the sides of the structures are mostly left open, to afford free ventilation for cool-ing the condensers and drying the ores.

Despite the necessity of making all improvements without any inter-ruption to the regular production, the works are well and conveniently arranged, and are kept in excellent order.

In addition to the main plant above mentioned, there are soot-floors and kettles. bath-rooms for the men, the offices of the company, the carpen-ter and the machine-shop. The latter is furnished with between three and four horse-power by an overshot wheel, 6 feet wide and 20 feet in diameter. (TO BE CONTINUED.)

Norg.-In succeeding issues, we shall give ground-plan and horizontal sections and another vertical section of the Granzita furnace.

Colliers' Risks.—The Colliery Guardian says: It is popularly sup-posed that the occupation of a coal miner is the most dangerous of any calling. The study of statistical tables, published by foreign govern-ments, however, seems to disprove this theory. In these tables, it appears that the risks in some other occupations are not merely equal to the miner's, but notably greater. The Annuaire Statistique of Belgium, issued by the Minister of the Interior, contains a striking comparison bearing on this fact. Four years of accidents in coal mines are compared with those of a like period of time on the railroads of that country, the employés only being taken account of. The period is from 1879 to 1882 inclusive. It should be borne in mind, in making this comparison, that during these years some of the most destructive of fire-damp explosions took place. In 1879, one of the accidents occasioned 121 deaths ; and in 1881, another claimed sixty-eight victims. In spite of this fact, however, we learn that the number of fatal accidents among the colliers was 2.70 per 1000, while among the workmen and other employés of the railroads, the proportion was 3.56 per 1000. From these figures, it appears that a collier is exposed to considerably less risk than a railroad servant. The fact will come as a surprise to many who have been taught to regard the occupation of the miner as peculiarly danger-ous. It shows that the precautions taken in the colliery are efficacious, and should be sufficient to silence those ill-informed persons who, when-ever a colliery accident occurs, are ready to cry out against the manage-ment and to suggest more restrictions. ment and to suggest more restrictions.

EDITOR ENGINEERING AND MINING JOURNAL: SIR: The yield of the Wood River mines for the year ended December 81st. 1884, made upon the whole a satisfactory showing. The exact statistics have not been published; but it is generally conceded that the figures stand somewhere between \$2,500,000 and \$3,000,000. The product is mainly a high-grade argentiferous galena. The district begins with the mines near Bellevue, taking in those tributary to Hailey and Ketchum, and embracing a belt of country forty miles long by ten miles wide

Hailey and Ketchum, and embracing a belt of country forty miles long by ten miles wide. The formation generally is a blue siliceous lime, dark lime shale, with occasional protrusions of granite and porphyry. The surface of the country is mountainous, with narrow valleys and ravines cutting the formation like a checker-board, affording splendid drainage, and unequaled facilities for tunneling, whether on the course of the veins or zones or cross-cutting to them. The mines are mostly situated on the sides of the mountains, many hundreds, and sometimes thousands, of feet above the valleys; the mountain sides presenting an average declivity of 35 degrees from the horizon.

horizon

horizon. The valleys and cañons afford excellent water-power for concentrating mills, while the north side of the hills is thickly clothed with timber suitable for every purpose necessary in mining. It will be thus seen that we have here a combination of natural advantages for economical mining that is not often found. A great portion of the developments so far made have been by individual or associated individual enterprise. Incorporated companies, with moderate capitalization, have invested in some of these enterprises, and are working out their destiny, avoiding booms and dishonest stimulation. This speaks well for the country ; for once its prosperity is established, it will be upon a safe and permanent basis.

basis. It has been found profitable to work only the higher-grade ores, say those containing an excess of \$80 per ton in lead and silver. This has been owing to the cost of smelting, transportation, and miners' wages. Smelting and railroad transportation charges, however, have been reduced; mining supplies of all kinds and provisions, through active com-petition, are cheaper, while miners' wages alone remain unmoved. The decrease in the value of silver and lead is seriously felt by mine-owners; and in the adjustment of values, they think it but fair that the rate of miners' wages should be reduced from \$4 a day, now prevailing, to \$3.50 or \$3 a day, which are the prices obtaining in Utah and Mon-tana.

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tana. The Minnie Moore and Queen of the Hills, leading mines near Bellevue, whose products are mostly so-called low-grade ores, but worth in the market from \$80 to \$90 a ton, found it necessary to economize by reduc-ing expenses, among them miners' wages. The Miners' Union interfered, caused a strike, end is preventing any one from working in those mines for less than \$4 a day. Hence the enforced idleness of those mines. The matter is now in the courts. The outcome can not be questioned—wages must come to reasonable terms or mining constitutions come

matter is now in the courts. The outcome can not be questioned—wages must come to reasonable terms, or mining operations cease. The average of all the ores shipped from the mines runs about 125 ounces of silver and 60 per cent lead per ton. About one third is sacked clean at the mines, and two thirds shipped from the various concentrat-ing-works; for it may be said that, without crushing and concentrating mills, mining would amount to but little in this part of Idaho. It might be asked whether, with an average of such high-grade ores, and natural advantages for working, notwithstanding, bigh charges for

and natural advantages for working, notwithstanding high charges for smelting, freight, and labor, there is not a very large margin for profit left.

CHARACTER OF WOOD RIVER VEINS.

To answer this fully, it is necessary that the vein phenomena of the country should be taken into account and explained. We are dealing with a class of veins or zones that, though avowedly rich in places, are extremely erratic. I know of no better region to send a mining student to than this, to learn of the geological eccentricities both of the veins and the ore-chutes or deposits in them. After an ore-body is found, it is something to keep with it. It may shift laterally, be thrown under, above, to the rear or in front, any or all ways, by slins, faults, and cross-fissures, so that your previous work

Finit laterally, be thrown under, above, to the rear of in front, any or all ways, by slips, faults, and cross-fissures, so that your previous work sometimes may be wasted, and new plans and new operations involving new capital become necessary. To-day, you think you have a fortune; to-morrow, you are surrounded by hard lime, with not the slightest trace of vein or ore to be seen. These occurrences puzzle prospectors, mine-owners, and superintendents alike. Did they not exist, Wood River as a mining field would stand second to but few mining districts ever opened

a mining field would stand second to but few mining districts ever opened. Two of the hitherto most productive mines of this section are now wrestling with a problem of this kind. They will no doubt conquer, and resume large shipments and earnings; but it upsets calculations, inter-feres not only with profits, but with working expenses, and keeps those in charge in perpetual study to surmount present or coming difficulties. These offset in part what would otherwise be very large profits ; but it must not be inferred that mining here has not been profitable. Such is not the case. The bistory of the district shows a most excellent record for the amount of time and capital invested. Only five years back, all this region was a wilderness inhabited by Indians; and since then, such satisfactory developments have been made as to attract wide attention among capitalists, as a field for profitable investment.

investment.

In my next letter, I shall refer to the most prominent mines worked.

Hard-Drawn Copper Wire.—It is said that hard-drawn copper tele-graph wire has stood the severe tests of the winter very satisfactorily, and an extension of its use may be expected.

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Convention of Electric Lighting Companies.—Representatives of various electric lighting companies of the United States and Canada met in Chicago last week to perfect an organization with the view of advanc-ing their various interests. The convention chose permanent officers as follows: J. F. Morrison, of Baltimore, President, and W. A. Hovey, of Boston Secretary. Boston, Secretary.

THE ENGINEERING AND MINING JOURNAL.

Through the ore-chamber. Through the fire-place VERTICAL SECTIONS. Z h n C C 67 01 C C C 0 ----0 0 B æ BC © C 0 0 CO 0 0 0 CG CO 0 0 0 0 0 0 0 0 0 ----0 0 9 e 0 0 0 10 00 12222 0 Ó 00 0 0 BC) BEC C 0 0 CE 0 0 0 0 0 11 0 1 0 0 0 0 1 a n NT. -0-1 ·l k. Ъ Q

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FURNACE, MILL, AND FACTORY.

P. A. & W. V. Ahl, Carlisle, Pa., have made an assignment for the benefit of their creditors. Dullness in the iron market and protracted illness of members of the firm are said to have led to the failure

H. N. Hoffstot has sold his interest in the Pittsburg Steel Casting Company to William Hainsworth, and the position of secretary having been thus vacated, the board of directors have elected William Lyon Secretary pro tem.

Boston capitalists recently purchased the Birmingham Fire-Brick Works, Birmingham, Ala., and are remodeling the kilns, preparing to manufacture fire-brick from a mixture of clays they have been experimenting with, claiming it will make a superior firebrick to any that is now in the Southern market for furnace purposes

Reports from Birmingham, Ala., state that the large mill of the Birmingham Rolling-Mill Company is running in all departments, turning out merchant and The forge department, containing 22 sheet-iron. double puddling-furnaces, two single puddling-furnaces, and one scrap-furnace, is on double turn, as is also the guide-mill. The company reports a brisk increase in orders the past two weeks, but no improvement in prices. The little Mary Pratt furnace continues to do well, averaging an output of about 45 tons daily. The Sloss furnaces are both in blast, but are not doing as well as could be desired, especially No. 2. These two furnaces average from 70 to 75 tons each daily. The fires have been again kindled. No. 1 and No. 2 Alice furnaces are in blast, and average about 140 tons daily.

Proposals will be received by the Philadelphia Gas Works until March 12th for 1460 lengths, more or less of twenty-inch cast-iron pipe, together with the other castings required.

The engineer of the Fourth Light-House District, Post-Office Building, Philadelphia, will receive proposals until March 13th, from iron manufacturers only, for the construction of the iron-work of a tower for a beacon light at Delaware Breakwater. The tower will be formed of cast-iron plates bolted together, and will weigh about 50 tons. Plans, specifications, forms of proposal, and other information may be obtained on application to the office of the Light-House Board, Washington, D. C.

The rolling-mill of Andrew Brothers & Co., at Hazleton, Pa., has started up on double time. The Girard blast-furnace at the same place has also resumed.

The iron-mill of Antrim, Osborne & Son, at Rose Valley, near Chester, Pa., was burned March 2d. The loss is estimated at about \$50,000.

The property known as the Patapsco Bridge and Iron-Works, situated at Canton (and partly in the city of Baltimore and partly in Baltimore County), Md., will be sold with or without machinery. This property is well suited for manufacturing purposes, marine work, storage, or for a local pier, and adjoins that recently purchased by the Baltimore & Ohio Railroad for its Philadelphia extension.

The Vulcan Boiler and Steel and Iron-Works of James McNeil & Co., at Pittsburg, Pa., were burned March 3d. Loss. \$18,000.

Welch & Griffiths, manufacturers of and dealers in saws, emery wheels, and mill supplies, and importers of French saws, Boston, Mass., have failed, with liabilities of about \$50,000, and nominal assets of \$53,550.

The Girard Furnace, at Girard, Ohio, started up March 4th. The rolling-mills at the same place have resumed operations

Jefferson charcoal furnace, owned by J. M. & H. Y. Kaufman, of Auburn, Pa., has been put in blast after a suspension of four months.

It has been decided to put the Union Iron and Steel-Works, Chicago, in thorough repair, and to alter them so as to produce Bessemer rods by the direct process.

The St. Louis & San Francisco Railroad Company has closed a contract with the Union Bridge Company, of New York, for the construction of an iron bridge across the Arkansas River, at Van Buren, Ark.

W. G. Hyndman & Co., manufacturers of sheet-iron roofing, Cincinnati, Ohio, have issued a neat circular calling attention to the different varieties of styles of roofing and siding that they are manufacturing, among which we notice old style V crimp roofing, new style standing seam roofing, roll and cap roofing, corrugated roofing and siding, and this month they will put upon the market their new metallic shingle.

A long report has been presented to the Senate from the committee appointed to inquire into the capacity of steel-producing works in the United States, and on motion of Mr. Morgan the committee was continued, and instructed to further report to the Senate in December, 1885.

Mr. T. E. Scrymser, lessee of the rolling-mill at Laramie, Wyoming, is considering the question of erecting a foundry in connection with his other works.

LABOR AND WAGES.

The Committee on Labor in the Massachusetts Legislature is considering various petitions that have been presented to it for the establishment of courts of arbitration between employers and employed.

The coal miners of Pittsburg District, at a repr entative convention held at Pittsburg, Pa., March 3d, refused to accept the trade's tribunal rate of 21% cents a bushel, awarded by Umpire Weeks, and, after denouncing the umpire for his decision, resolved to strike March 9th for three cents a bushel. The operators assert that they will not pay the advance demanded by the convention, and, if insisted upon, they will close down their mines

The miners of the Cumberland Railroad and Coal Company at Spring Hill mines, Nova Scotia, have accepted a reduction of three cents a box on coalcuttings.

At the meeting of the Ohio State Trades and Labor Assembly, lately held at Columbus, President Connolly strongly advocated the solid combination of all trades unions in one central body.

The Taunton Iron-Works, Taunton, Mass., started up March 2d at a five per cent reduction.

The Westmoreland Coal Company, Pa., has posted a notice that it will pay but 50 cents a ton for mining after March 1st.

The workmen in the Wabash Railroad machine-shops at Moberly, Mo., are out on a strike in consequence of a reduction of wages.

RAILROAD NEWS.

The Mexican-American Construction Company began the American & Mexican Pacific Railroad at Topolobampo Harbor, State of Sinaloa, Mexico, on February 17th, and grading is now advancing eastward at the rate of half a mile a day. It is proposed to complete ninety miles of road before March, 1886. which will open up the Fuerte Valley, one of the richest in Mexico.

A syndicate of New York, Philadelphia, and Pitts burg capitalists has purchased the charter of the Turtle Creek Valley Railroad route, which extends from Turtle Creek to Pittsburg, a distance of eighty-three miles. The route will open up a rich mineral country, and give the Rochester & Pittsburg and seaboard and Western roads an advantageous outlet from Pittsburg.

The receiver of the Louisville, Evansville & St. Louis Railroad has been granted the order by the court, authorizing the purchase of 500 tons of steel rails and the rent of two locomotives.

It is stated that the Canadian government h greed to accept the proposition of the Canadian Pacific Railroad Company to take over its lands, some 20,000,000 acres, at a valuation of \$2 an acre, for which the company would receive \$40,000,000 in cash. This would enable the company to pay off its floating debt of \$4,000,000, and have enough left to complete the road.

The annual report of the Pennsylvania Railroad Company for 1884 shows that the gross earnings from traffic on all lines were \$97,849,875, a decrease of \$7,803,657, as compared with 1883. The gross expenses were \$64,434,317, a decrease of \$4,482,739, as compared with 1883. The net earnings therefore showed a decrease of \$3,320,918 in 1884, as compared with 1883. The report states that the directors share the opinion with other large transportation interests of the country that the further maintenance of the present pooling system under existing arrangements can hardly be productive of good either to the public or to the railroad interests.

The Clearfield & Jefferson Railroad Company has been chartered with a capital of \$1,000,000. The road will run through Clearfield, Jefferson, and Indiana counties, a distance of 32 miles. Charles F. Berwind, of Philadelphia, is president.

The earnings of the Philadelphia & Reading Raiload for January were \$1,846,366.25; the expe

excluding rentals and interest, \$1,242,965.92; and the net earnings, \$603,400.33, against \$759,132.83 for the corresponding month last year. The gross receipts of the Coal and Iron Company were \$844,789.12; the expenses, excluding interest, \$905,634.26, being a net loss of \$60,845.14, against a loss of \$91,666.40 for January, 1884. The net earnings of both companies for the fiscal year to date were \$1,414,012, against \$1,446,913 for the corresponding period of last year. Judge Hallett, in the United States Court of Colo-

rado, has rendered an important decision defining the status of car trusts. The decision was rendered on a petition that interest should be paid on the company's bonds next after operating expenses had been paid. This application was resisted by holders of car trusts. Judge Hallett decided that car trusts, principal and interest, were prior securities, and must be paid out of the income, the same as wages and labor, ranking prior to even first mortgage bonds.

COAL TRADE NOTES.

A terrific explosion occurred in the Usworth colliery at Sunderland, England, March 3d. The explosion is said to have been caused by fire-damp. Thirty-six dead bodies have already been recovered from the ruins, and a volunteer force is still engaged in seeking for more victims. At the time of the explosion, there were 150 men in the mine. These were all imprisoned by the jamming of the cageway.

ALABAMA.

The Pratt mines, six miles from Birmingham, are in full operation, putting out from 2400 to 2600 tons of coal daily, and are also making quite a large amount of coke in their ovens at the mines, furnishing the Mary Pratt and the Oxmoor furnaces and also shipping to other points. CANADA.

PROVINCE OF MANITOBA

The machinery for the petroleum wells of the Winnipeg & Northwest Petroleum Company is on its way to the wells, which are about 140 miles from Gleichen. Facilities have been provided for boring to a depth of 2800 feet.

MARYLAND.

The case of the Maryland Coal Company vs. the George's Creek Consolidated Coal Company, of Balti, more, will be taken up in the May term of court. The suit is over the ownership of a strip of land in the town of Lonaconing. MISSOURI.

A coal company, with a capital of \$300,000, has been organized to operate coal mines at Minden. NEW YORK.

The suit of Robert Collins against the Standard Oil Company to recover \$20,000 damages for injuries received from defective machinery while in the company's employ, the trial of which had begun in the Supreme Court, this city, was settled March 3d for \$1000.

OHIO.

The parties that bought the coal properties of the Ohio Central Coal Company on the 17th of February are making arrangements to reorganize. Holders of undeposited bonds, if they desire to be recognized in the reorganization of these properties, must deposit such bonds with the Central Trust Company in this city on or before March 10th, together with two per cent cash assessment

Rainey's coal-works, Martin's Ferry, are now running full-time.

NATURAL GAS.

The Cincinnati Warehouse and Malting Company has discovered gas in a well bored for water to the depth of 256 feet, but abandoned. The gas has a pressure of 25 feet to the inch, and the company is preparing to use it for heating kilns and ultimately for lighting the building.

PENNSYLVANIA ANTHRACITE

The reports of the Mine Inspectors for January are as follows

Pottsville District-Samuel Gay, inspector : Accidents, 6; injured, 6. Total number of employés, 4320; average number of days employed, 162-5; number of tons of coal mined, 99,527.17. No fatal accidents in this district for the month.

Shenandoah District-Robert Mauchlin, inspector: Accidents, 9; killed, 1; injured, 8. Total number of employés, 9436; average number of days employed, 12; number of tons of coal shipped, 204, 170.03.

Shamokin District-James Ryan, inspector : Acci-

MARCH 7, 1885.

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employés, 9896 ; average number of days employed, 14 ; number of tons of coal mined, 233,980 10. recently opened out a showing of superior grade of hard carbonate, with formation crevices from ledge

The Indian Ridge Colliery, operated by the Philadelphia & Reading Railroad Company, at Shenandoah, Pa., resumed operations March 2d, after ten weeks idlenes

Work has been resumed in the collieries of S. S. Bickel & Co., and Issac May & Co., at Centralia. COKE.

The Consolidated Gas-Coal Company, of Frostburg, Md., has purchased the farm of Robert Duncan, near Dawson, and expects to erect ovens and develop the coal in the near future.

The new coke plant of J. W. Moore, at Mount Pleasant, will be called the Mammoth Works.

The Waverley Coal Company has resumed work at Smithton, and it is said that some of its coke-ovens will be fired soon.

NATURAL GAS.

The Fuel-Gas Company has struck its eighth well. Judge Hazen has refused to grant a special preliminary injunction against the use of natural gas. The application was made by the town council of Butler and argued at New Castle several weeks ago. The judge cited the recent decision of Judge Stowe as a precedent. The gas mains are leaking badly, endangering life and property, and a majority of the citizens are indignant because the injunction was not granted.

The court at Pittsburg has appointed a commission to examine into the condition of the Penn and Fuel-Gas companies' pipe lines, now in use or intended to be used by them for the purpose of transporting natural gas within the city of Pittsburg, the manner of their use, present or prospective (including the degree of pressure thereon), and the danger of explosion or other public injury incident to or likely to arise from the use of said pipes for transporting and supplying gas to consumers. The commission is directed to make a report within sixty days.

The first meeting of the commission appointed to take testimony as to the causes of the recent gas explosions in Lawrenceville was held March 2d. W. D. Hartupee, General Manager of the Consolidated Penn Fuel and Fuel-Gas Companies, was the only witness examined. He said the gas companies have taken, various precautions to prevent further explosions. New valves have been put in, and the whole system of pipage has been thoroughly examined and improved, and terra-cotta waste-pipes have been put in to carry off escaping gas. It is the intention of the company to lay its present high-pressure mains along the river-bank as soon as the work can be done; engineers were already locating the line ; and as soon as the change is made, the present high-pressure mains will be converted into low-pressure mains.

WYOMING.

The organization of a coal company, in which the consumers of coal will be permitted to take stock, is contemplated at Laramie. The object of this company is to get coal from the coal-banks in township 18, range 77, about twenty-five miles in a northwesterly direction from Laramie, south of Dutton Creek, a tributary of Cooper Lake. Large coal-banks have been open here for the past ten years, and the coal has been mined and used since then. It is thought that this coal can be mined and delivered at Laramie a \$4 for ton.

GENERAL MINING NEWS.

ARIZONA.

COCHISE COUNTY-TOMBSTONE DISTRICT. CONTENTION .- It is not likely that much will be done prior to the completion of the pumps. The mill is running constantly on the immense tailings-dump that has accumulated there.

EMERALD.-Shipments to mill are at the rate of 800 tons a month. The two shafts, 250 feet apart, are connected on the ledge both on the 150 and 250-foot level, while the north drift is down 350 feet and sinking progressing.

GRAND CENTRAL.-The pumps will probably be ready to begin sinking about the first of June. All the ore shipped now to mill is taken from above the 500foot level and mostly from the 400 level and above.

HEAD CENTER .- The daily shipments amount to thirty-two teas to the mill. The main shaft is down 200 feet, with drifting on ore progressing on the 100. and 200-foot, on which latter there are now upward of 500 feet of work.

LUCK SURE .- Chloriders have been at work on the

dents, 12; killed, 3; injured, 9. Total number of lower level of the lower ledge for some time, and have give any individual or corporation sixty town lots, if it indicative of opening into a chimney.

MAMIE.-Preparations for putting the mine in proper shape for work are progressing STATE OF MAINE .- Workings now down over 500

feet, work going on under lease with continued output of limited quantity of exceedingly high-grade ore. STONEWALL .- A daily shipment is made to the Tombstone Mining and Milling Company's Millville smelter of manganese ore.

TOMBSTONE .- Smelter and both mills at Millville are unning constantly on ore from West Side and Stone wall principally. It is stated that in the lower work-ings of the West Side and from the ledge a chamber of high-grade ore has been opened.

PINAL COUNTY.

VEKOL.-Steady shipments of high-grade ore from this mine are made to Kansas City. The 10-stamp mill erected to work the second-class ore on the dumps is idle, owing to the want of water.

CALIFORNIA.

CALAVERAS COUNTY.

CALAVERAS WATER AND MINING COMPANY .-- A judgment of \$17,019 has been entered in this city against the company by J. H. Southwick.

NEVADA COUNTY.

NEVADA & ORIGINAL EMPIRE.-The litigation between the Nevada Gold and Silver Mining Company and the Original Empire Mining Company has been settled to the satisfaction of the parties concerned. Also the suits between the Original Empire and David Watt and James Bennallack have been satisfactorily settled.

PLUMAS COUNTY.

ENGLES.-Arrangements are nearly completed for the erection during the coming summer of a 30-ton water-jacket furnace at the Engles copper claim. The ledge is fifty feet wide, and it is believed to be a good quality of ore.

SIERRA COUNTY.

BALD MOUNTAIN .- Rich gravel has recently been struck in the new level of this drift mine, at Forest City.

PIONEER GOLD MINING COMPANY .- A long and elaborate decision has been rendered by Judges Sawyer and Sabin, of San Francisco, in the case of the Pioneer Gold Mining Company vs. Benjamin F. Baker. The suit was brought in 1883 in the Superior Court of Sierra County, to establish a right to redeem the Pioneer mine, situated in that county, under an alleged mortgage said to have been created and effected by virtue of certain contracts and sales. Baker was the original owner of the mine, and sold the same to the plaintiffs in consideration of \$112,500 cash, and the remainder, making up the whole amount, \$255,000, was to be paid from the profits of the mine. These notes formed the alleged mortgage ; but as the mine failed to yield as well as expected, they were unpaid, and Baker, who acted as superintendent, took it upon himself to hold possession of the mine. This caused the action at law. In the decision, which is an interlocutory one, the right of the plaintiffs to the mine is upheld, and their right to work the same conceded. It was therefore ordered that a preliminary decree be entered in favor of plaintiffs, and the case be referred to the standing master in chancery of the court between the parties, to report the same to the court.

CANADA.

PROVINCE OF QUEBEC.

MARLOW SILVER MINE.-The mine has not vet passed the prospecting stage. There are four good veins, ranging from 10 to 20 inches thick, carrying from 15 ounces up to 260 ounces of silver per ton. Large samples are taken out for working tests.

COLORADO. ARAPAHOE COUNTY.

STANTON ENGINEERING COMPANY .- The incorporators are Roger W. Woodbury, Robert B. Stanton. Edwin H. Kellogg, Sherman G. Sackett, and Edward W. French. The objects are to carry on the business of engineering and of milling, concentrating, and smelting ores, and of buying and selling concentrat-ing and other like machinery. The capital stock is \$25,000. The operations will be carried on in Arapahoe County, with the principal businessoffice in Denver.

CLEAR CREEK COUNTY. The Board of Trustees of Empire will, it is stated,

will build water-works in the town of Empire. SNOW-DRIFT .-- Nearly all the available ground has been leased.

HINSDALE COUNTY.

CROOKE MINING AND SMELTING COMPANY, LIM-ITED.-Reuben Rickard, the English manager, has been called to London for the purpose of arranging matters. LAKE COUNTY.

The Leadville Herald has the following :

COLONEL SELLERS .- Fifty tons of orea day are produced under contracts with Pueblo, Kansas City, and Leadville smelters. A drift has been opened into a carbonate body, and a shipment of fifty tons made that netted over two thousand dollars. The pumps in No. 2 shaft are doing all the work required of them.

DENVER CITY .- Iron ore of fair grade is shipped.

LEADVILLE ANNEX.-The object of this company is to sink a shaft within the city limits or the suburbs to a depth of one thousand feet if necessary, to demonstrate the fact that the ore-bodies continue from Fryer and Carbonate hills underneath the city. The capitalization of the company is ten million dollars, divided into one million shares of ten dollars par value each. The incorporators are Homer Pennock, J. S. Fritz. C. C. Davis, E. C. Guilbault, W. S. Pemberthy, A. V. Hunter, and J. W. Wallace. The period of existence is to be twenty years. The necessary preliminaries will be completed as rapidly as possible, and work will be commenced as soon as this is done.

LEADVILLE .- The recent strike shows ore of high grade. It was struck at a depth of seventy feet.

MORNING AND EVENING STAR .- All the ground on these properties for lease has been secured by various parties, and will be actively worked.

ROBERT E. LEE.-Shipments of iron and ore are increasing.

PARK COUNTY.

Sovereign.-The erection of a mining plant, with capacity for treating at least 100 tons a day, will soon begin. Immediately following this, it is probable that operations will begin at the placer grounds.

PITKIN COUNTY.

SMUGGLER.-The lessees who have the lease upon the upper or northern end of the Smuggler are now in 190 et from the mouth of the old tunnel on the Arkansas ground, and have made about 95 feet on the Smuggler ground in the drift where they are working.

VALLEJO.-The erection of a tramway, running from the mine to the sampling-works, will soon begin. The distance is about 2800 feet. The trestles will be twenty feet in hight and about forty feet apart. The buckets will be about thirty feet apart, and when one is loading at the mine, one will be emptied at or near the sampling-works. The machinery will be furnished by the Colorado National Tube-Works of Denver.

SAGUACHE COUNTY.

II. S. MINING AND MILLING COMPANY.-The smelter at Parkville has begun operations, and has been running successfully. The treatment that has been inaugurated by Professor West, late of the Golden Smelting Company, consists in roasting the ores as a preliminary measure, and then smelting into a matte without the aid of lead or any fluxing except what iron and spar is contained in the raw state.

SAN JUAN COUNTY.

MYSTERY .- This mining, milling, and tunnel company has been incorporated with a capital stock of \$1,000,000. Operations will be carried on in San Juan County, with the principal business office in Gladstone.

SUMMIT COUNTY.

ROBINSON CONSOLIDATED.-The recent discoveries will no doubt justify the lessee in the thorough exploration-work he has mapped out.

ROBINSON CONSOLIDATED .- At the annual meeting held in this city March 3d, the following officers were elected : Thomas I. Richman, John Jay White, A. J. Robinson, James Russell White, M. W. Morris, T. Webster, H. E. Woods. At the first meeting of the new Board of Trustees, the following officers were elected : President, Thomas I. Richman ; Vice-President, John Jay White ; Secretary, F. C. Poucher.

DAKOTA LAWRENCE COUNTY.

FATHER DE SMET .- The superintendent reports, for the week ended February 22d, ore extracted from first, second, and third levels, 1905 tons. Ore milled, 1955

GEORGIA.

OGLETHORPE COUNTY.

The suit in trover and conversion by Col. James K. Scofield against J. B. Moorhead to recover the value of the machinery, tools, etc., of a gold mine in this county, before Judge Hare, in Court of Common Pleas, No. 2. Philadelphia, Pa., February 27th, resulted in a verdict for the plaintiff. Mr. Moorhead had sold the property to Colonel Scofield for \$10,000, to be paid for partly in cash and the remainder (\$8000) in notes. Cash payments amounting to \$2500 were made, and Colonel Scofield's own notes were given without an indorser and accepted by Mr. Moorhead. Colonel Scofield claimed that, under the contract, the title to the personal property vested in him, and that the defendant had no right to seize the machinery and sell it as he did. The answer to this was, that the contract between the parties provided that the notes that Colonel Scofield was to give were "notes with approved secu rity ;" that he was unable to give security, but offered the defendant a mortgage on the property, which was declined ; that in lieu thereof, Mr. Moorhead was to hold the title to the property as security for the payment of the notes : and that, as Colonel Scofield paid only \$500 of the \$8000 in notes, the defendant had a perfect right to enter and treat the goods as his own, and deal with them as such. In the dealings between the parties, the defendant had waived the right of forfeiture of the contract, and extended the time of payment, and the question of fact that the judge left to the jury was, whether Colonel Scofield was entitled to more time or not. He bought the property in September, 1881, and Mr. Moorhead sold the personal property to another in April, 1883, for \$1825. The jury returned a verdict for the plaintiff for \$10,000, allowing a credit of \$8000 for the notes. The verdict was recorded as a verdict of \$2000 for the plaintiff.

IDAHO.

The trouble with the Miners' Union in Wood River continue

QUEEN OF THE HILLS.-It is stated that the company intends to take a large force of non-union miners into Wood River, who will work for less than \$4 a day, and who will be numerically strong enough to withstand the union in its assaults.

MEXICO.

We have received the following from Prof. William P. Blake, under date of Guaymas, January 20th :

The event of chief interest in mining circles of recent date in Sonora, Mexico, is the sale of the Trinidad silver mines to a prominent banking house for London account. These mines are said to have been worked for the past forty years, most of the time by Mathias Alsua, and the product sent to Guaymas. The sale includes the Bronces silver mines and a large part of the coal-field at Barrancas, and about five leagues of splendid productive land. The consideration to be paid is \$1,500,000, in equal monthly payments of \$50,000 each. The expenses of the sale, amounting to \$38,000, and the first installment of \$50,000 have already been paid. The gross value of the ore now standing above water-level is reported as not less than \$12,000,000. There are not less than thirteen miles of drifts. The rock is said to be hard and the veins narrow but rich. The ore has been worked hitherto in a 20-stamp mill, but it is the intention of the company, according to reports, to erect three mills, each of 100 stamps, for this and the Bronces mine. El Trinidad lies on the west side of the Sierra Madre, near the head-waters of the Rio Mayo. The mines are most conveniently reached from Ortiz station on the Sonora Railroad. from which point it is proposed to build a branch railroad to the mines. It is said that a large part of the machinery has already been ordered and is on the way. A party, including a representative of the Union Iron-Works of San Francisco, and Mr. Carr, the well-known freighter of Arizona, came here from Tombstone a few days ago and have gone to the mines by way of Ortiz. At the rate of payment named, it will require 21/2 years to complete the transaction. The examinations and reports on the property are said to have been made by two different parties of mining engineers from England. The negotiation was concluded in November and December, 1884. Mr. Alexander M. Womble is the superintendent.

MICHIGAN.

The House has fixed March 18th as the date for the consideration of the bill to allow the minority of share-

the laws of Michigan to elect a number of the directors, which number is to be based upon the proportion that the minority bears to the majority of shareholders. This measure was passed by the Legislature two years ago, but was not approved by the governor. It is strongly antagonized by the upper peninsula mining corporations, which allege that the motive for it is a desire of dissatisfied shareholders to influence the man agement of corporations to the disadvantage of the majority of owners.

It is said that the Legislature will be called upon consider a bill making some radical changes in the relations between the lessees and lessors of mineral properties. The most important of these, perhaps, is that relating to royalties. The bill proposes to fix maximum royalties on ore, etc. It is open to considerable objection on this score, as well as in other respects.

A bill has been introduced in the Senate for the establishment of a mining school in the Upper Peninsula.

The bill introduced by Senator Stephenson placing a specific tax upon minerals produced in this State is, it is said, of much importance to the Upper Peninsula. It makes no change in the tax imposed on iron and copper, hence the first impression would be that it in nowise affects our mining industries. This impression will disappear when we state that, under the law as it stands, all other minerals mined in Michigan, including gold and silver, are subject to a specific tax of "four per cent of their average yield and value." The bill does not name the tax to be imposed on the precious metals, this being left to the Legislature to fix and determine. The bill was drafted by Hon, William P. Healy, of Marquette.

IRON MINES

IRON CLIFFS.-Senator Hubbell has asked, on behalf of the State, for a rehearing, in the Supreme Court, in the test case on the tax law, entitled the State vs. Th Iron Cliffs Company.

IRON RIVER .- The owners and stockholders entered into agreements at Youngstown that will warrant a good summer's work

NORTHWESTERN .- The mine is pumping out, and is preparing for active running work to begin on the opening of the shipping season.

MINNESOTA.

ONEOTA.-The mine is now entirely owned by A. E. Sears, James Malloch, John Turcott, and S. L. Smith, and the shares are all withdrawn from the market. Operations have again begun, and the shaft is sunk to a depth of nearly sixty feet. The present owners will put in a large stamp-machine and an engine with sufficient power to run it and also hoist the ore that is mined to the surface. Negotiations are making with the Chicago Smelting-Works, by which they will handle all the ore.

MONTANA. BEAVERHEAD COUNTY.

HECLA CONSOLIDATED.-The production for January was as follows : 32.72 ounces of gold ; 50,642.30 ounces of silver ; 447,337 pounds of lead ; and 27,177 pounds of copper.

MADISON COUNTY.

MILL CREEK MINING, MILLING, AND SMELTING COMPANY .- The company has been organized under the laws of Utah with a capital stock of \$500,000, divided into 100,000 shares, of which 26,000 shares are set apart as treasury stock. The property of the company consists of the mining claims in Mill Creek Mining District. The principal place of business is Salt Lake City.

SILVER BOW COUNTY.

CHAMPION.-Ore is produced regularly and is shipped to the Moulton for reduction.

HOPE.-The owners are negotiating for a bond of \$60,000. The ore contains sulphurets of silver, argentiferous gray copper, and mispickel, with hornbl nde and calc-spar on the foot-wall. The ore is free milling and contains rich bodies of silver glance.

SNOW DRIFT & SILVER LICK .- These claims adjoining the Margaret Ann lode on the north and west have en bonded to a California company for \$45,000. The Snow Drift vein contains peroxide of manganese with black sulphurets and chlorides of silver. The ore is free milling above water-level. The Silver Lick ore contains manganese, pyrites of iron, sulphurets, and flecks of ruby silver.

NEVADA.

CHURCHILL COUNTY.

The Cottonwood nickel and cobalt mines in Cottonholders in all joint-stock companies organized under wood Cafion are attracting the attention of French 1700 shares. Chollar ranged from \$2@\$2.50; sales

capitalists. The mines in that section, owned by George Lovelock, are bonded to San Francisco men, who are negotiating with Frenchmen for their purchase. One of these mines has been worked somewhat extensively, and some 65 tons of the ore sent to San Francisco sold there for high prices.

ESMERALDA COUNTY.

A company has been formed in London for the purchase of the property known as the White Mountain Water-Works, at Candelaria, and the mill and mill site there known as the Princess mill and mill-site, and for other purposes. The principal object is to supply the town of Candelaria and the Columbus Mining District with water, to be conveyed from the White Mountains in pipes. The capital is to be \$1,000,000 in 200,000 shares of \$5 each.

EUREKA COUNTY.

RICHMOND CONSOLIDATED,-Owing to the bad condition of the roads, the mine and furnaces closed February 25th. Operations will be resumed about May 1st. Custom ores will be received at the furnaces

STOREY COUNTY-COMSTOCK LODE.

HALE & NORCROSS.-Recent developments, it is said, show that the prospects are better than for years. UTAH.

BEAVER COUNTY.

COMET.-Ample capital has been raised in Paris to develop the property.

HORN-SILVER .- According to the Frisco Times, one hundred men have been discharged. The mine is said to be in such a condition since the recent cave that not more than a score of men can be employed to advantage for some time to come.

SUMMIT COUNTY.

ONTARIO .- Every thing is moving on in its accustomed steady way, and large quantities of ore are produced.

FINANCIAL.

Gold and Silver Stocks.

NEW YORK, Friday Evening, March 6.

At last, we are able to report a decided improvement in the mining market. Transactions in stocks that have not been dealt in for weeks are recorded, and the sales this week show an increase of 50,951 shares, as compared with the sales of the previous week. The total sales amounted to 101,723 shares. Prices have been firm, with higher tendencies

The official announcement was to-day made that the vote on consolidation of the New York Petroleum Exchange with the Mining and National Board was unanimously in the affirmative.

Iron Silver, which has been dormant for weeks appears again on the list, with sales of 2950 shares; the price advanced from 75c.@\$1.15. The reports made this year show that the company is in good condition and had cash on hand January 1st \$84,461.61, and February 1st \$115,334.77. In another colum we publish extracts from the company's annual report.

Little Chief has been active at from 22@25c., with ales of 3900 shares. Robinson Consolidated shows a larger business at from 40@50c. Affairs at the mine are said to be more encouraging. Dunkin sold at from 23@25c. Amie, at from 3@5c. Bassick, at from \$3@\$3.25. Leadville, at 35c.

The business and the prices of Standard Consolidated have advanced. The new management, it is said, has reduced the salaries and expenses at the different offices, and is placing the affairs of the company in good condition. The sales amounted to 5095 shares, ranging from 85c. @\$1.20. Consolidated Pacific has also shown a larger business at from 90c.@\$1, with sales of 8250 shares. Bodie Consolidated and Bulwer have been quiet ; the price of the former ranging from \$2.20@\$2.75, and that of the latter from 28@ 35c. Plymouth Consolidated ranged from \$15.88@ \$16.38, with sales of 1860 shares. A record of the work done by this company during the past year will be found in another column.

In the Nevada stocks, a small boom has again struck Sutro Tunnel ; the price has been firm at from 12@15c., but the transactions have amounted to 26,300 sha Consolidated California & Virginia has followed ; the prices, however, fluctuated greatly, showing a downward tendency; the sales were 13,090 shares, at from 39@65c., closing at 39c. Hale & Norcross has been quiet ; the assessment of fifty cents brought the stock down from \$6 to \$5, 950 shares changing hands. Eureka Consolidated sold at from \$2.40@\$3; #

950 shares. The dealings in the other stocks show no interesting features.

Horn-Silver has been stronger, and has recovered from the low price of last week; 2103 shares changed hands at from \$1.70@\$2.10, closing at \$2. A small lot of Ontario was sold at \$17.50.

Alice shows larger sales at from \$2@\$2.05. One lot of 25 shares of Father de Smet sold at \$6. Caledonia, 100 shares, at \$1.15. Silver King holds its own at from \$3.95@\$4. Rappahannock has been active, with sales of 4900 shares, at from 6@10c. Central Arizona, at from 18@22c.

A complete summary of the market will be found elsewhere.

MEETINGS.

The annual meetings of the following companies for the election of trustees and the transaction of business will be held at the times mentioned :

Midas Petroleum and Improvement Company, office of George Woods, No. 116 Market street, Pittsburg, Pa., March 11th, at ten o'clock A.M.

Midland Mining Company, No. 234 South Fourth street, Philadelphia, Pa., March 17th, at twelve o'clock M.

Rockhill Iron and Coal Company, No. 320 Walnut street, Philadelphia, Pa., March 17th, at half-past eleven o'clock A.M.

DIVIDENDS.

Bonanza King Consolidated Mining and Milling Company, of California, has declared a dividend of \$10,000, or ten cents a share, payable on and after February 27th.

Plymouth Consolidated Mining Company, of California, has declared dividend No. 22, of \$50,000, payable on and after March 5th.

IVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF FEBRUARY AND FROM JANUARY 187, 1885

NAME OF COMPANY.	Location of mines.	Paid during month of February.	Since January 1st, 1885.
Adams, s. L. Atlantic, c. Bellevue-Idaho. Big Bend Hydraulic, G. Father de Smet, G. Hecla Cons, G. S. L. C. Helma, G. S. L. C. Homestake, G. Jocuistita, s. Moulton, S. Navsjo, S. L. Ontario, S. Oro Grande, G. Plymouth Con., G. Queen of the Hills. Quincy, c. Kooks, G.	Dak Mont Dak Mont Mex Nev Utah Cal ii Idaho Mich Vt	\$15,000 20,000 20,000 20,000 15,000 30,000 30,000 25,000 75,000 12,500 100,000 25,000	\$33,750 12,000 40,000 30,000 30,000 50,000 50,000 150,000 150,000 150,000 150,000 150,000 150,000 12,500

S., Silver ; L., Lead ; G., Gold ; C., Copper.

	ASS	ESSMENT	8.		
Companies.	No.	States.	Amount per share.	Delinquent in office.	Day of Sale.
Belmont		Nev	\$0.15	Mar. 21	April 13
Black Bear		Cal			* Mar 17
Bodie Tunnel	10	Cal	.20	Mar. 7	Mar. 28
Butte Creek, Hy- draulic	11	Cal	10	Man 0	Man 01
Caledonia	15	Dak	.10		Mar. 31 April 6
Champion	10	Cal	.10	Mar. 9	Mar. 26
Cueva Santa	10	Mex	.25	Feb. 27	
Eintracht Gravel	17	Cal.	.05	*Mar. 3	
Excelsior Water &		·····	.00	- 1141 . 0	MACHA NO S
Mining Co	7	Cal	.50	*Mar 11	*Mar 31
Exchequer.		Nev	.20	*Mar 3	
Golda		Cal	.03	Mar. 12	
Golden Channel		Cal	.01	Mar. 26	
nazard Gravel		Cal	.05	Feb. 25	
nomeward Bound					
Placer	3	Cal	.15	Mar. 12	April 6
indian Spring Drift	5	Cal	.03	Mar. 23	
nexican		Nev	,25	Mar. 27	
Uphir.	49	Nev	.50	Mar. 24	April 13
ULOBI		Nev	.25		Mar. 24
DAVEKO.		Nev	.50	Mar. 6	Mar. 26
SIETTE Nevada	81	Nev	.25	Mar. 25	April 14
Union Consolidated	29	Nev	.25	Mar . 24	April 14

*Has been published before. The date of delinquency of the above assessment and the sale day have been postponed until date given. PIPE LINE CERTIFICATES.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report as follows for the week :

The market this week was firm, in sympathy with the advancing figures of the stock market, but to-day it broke to the neighborhood of 79 till the last halfhour, when it broke to 78, and closed weak under heavy selling. Certificates are rather plentier than of late, and the feeling of traders is generally more bearish than when the price was five cents higher. The demand for refined is light, and the well news, while not definite, is indicative of a possible surprise somewhere to the east of Thorn Creek. The possibilities of a "gusher" there operate on the fears of the trade and cause weakness.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange :

LACI	ango.				
Ech	Opening.	Highest.	Lowest	Closing.	Sales.
Feb.	28 \$0.80%	\$0.82%	8914	50.81%	5,046,000

otal sales...... 30,563,000 BAN FRANCISCO MINING STOCK QUOTATIONS. Daily Range of Prices for the Week.

	CLOSING QUOTATIONS.												
NAME OF COMPANY.	Feb. 27.	Feb. 28.	March 2.	March 3.		March 5.							
Albion													
Alpha Alta	.25	.30	.30	.30	.30	.30							
Bechtel			.70										
Belle Isle						.70							
Best & Belcher Bodie	.90 2.25		2.50		2.371/2	1.00 2 50							
Bullion Bulwer													
Chollar Con. Pacific	2.50	2.50 .95 .55	2.00 .95 .50	2.311/2	2.371/2	1.00							
Con. Cal & Va Crown Point			.80			.40 .80							
Day Elko Cons													
Eureka Cons Exchequer	2.50												
Gould & Curry Grand Prize Hale & Norcross.	5.25		.80			.90							
Independence Martin White				1.0.279									
Mexican	.30	.40	.35	.40	.35	.35							
Mount Diablo Navajo				1.25									
Northern Belle North Belle Isle													
Opbir Overman	.20	.30	.30	.30	.25	.25							
Potosi Savage	1.00	1.00	.90 1.25	.95	1.00 1.25	1.00							
Scorpion Sierra Nevada	.30	.40	.35	.40	.35	.35							
Silver King Tip-Top		.35			1								
Union Cons Utah	.75	1.00	1.00	1.00	.80	.30							
Wales Cons Yellow Jacket					1.25	1.25							

Boston Copper and Silver Stocks. [From our Special Correspondent.]

BOSTON, March 5.

There is but little improvement to note in the condition of the market for mining stocks the past week. The volume of business continues light, and there is not much doing outside of the dividend-paying mines, and orders to buy these are very limited. In copper stocks, there was a little more doing in Calumet & Hecla at a decline of 22@44 a share from the closing price of last week. The opening price was \$155, and about 100 shares changed hands at this figure ; but later, a small lot sold at \$153, closing, however, to-day firmer at \$155 bid, and none offered under \$158. Quincy has ruled dull at a decline of 50c., all the sales being at \$29.50, as against \$30 last week. Franklin sold at \$6.50, same as before, and a small lot of Osceola at \$9.

In the silver stocks, Bonanza sold at %. Catalpa was in fair demand at 20c. Dunkin Silver improved to 22%@25c. Bowman was dull at 18@20c. Consolidated Pacific is firmer, with sales at \$1.

In the miscellaneous stocks at the Mining Board, there was but little business. American Electric and Illuminating Company sold at \$1 ex dividend, and is in good demand at the same price bid. The water meters are dull and heavy. Brunswick Berth declined to 10c. bid, on announcement of an assessment of 10c. a share. 3 P.M.—Allonez sold at 50c. Calumet & Hecla, \$155 bid. Quincy, \$29 bid, \$29\% asked. Franklin, offered at \$7. Osceols, \$8% bid, \$9 asked.

BULLION MARKET.

NEW YORK, Friday Evening, March 6.

The adjournment of Congress without action toward limiting or suspending the coinage of the standard dollar has not had the effect to appreciate the price of silver, as might have been reasonably anticipated.

DATE.	London.	N. Y.	DATE.	London.	N. Y.	
LATE.	Pence.	Cents.	DATE.	Pence.	Cents.	
Feb. 28 March 2 3	491% 491% 49	106% 106% 106%	March 4 5 6	49 49 49	1065% 10634 10634	

United States Mint at Philadelphia.—The coinage of the mint in the month of February was 6,678,060 pieces of the value of \$1,481,700. There were 23,340 eagles, 52,720 half-eagles, 900,000 silver dollars, 692,000 five-cent pieces, and 5,010,000 cents.

Foreign Bank Statements.—The governors of the Bank of England, at their regular weekly meeting, made no ohange in the bank's minimum rate of discount, and it remained 4 per cent. During the week, the bank gained $\pm 356,316$ bullion; but the proportion of its reserve to its liabilities was reduced from 461_4^3 to 46_{14}^3 , against 38% per cent at this date last year. March 5th, the bank gained $\pm 38,000$ bullion on balance. The weekly statement of the Bank of France shows a loss of 625,000 francs gold and a gain of 4,525,000francs silver.

BULLION PRODUCTION FOR 1885.

MINES.	States.	Month of January.	Year from Jan. 1st, 1885.
*Alice, G. S	Cal Nev Mont Ariz Mont Mont Mont Nev Colo Cal Cal Cal Utah	\$ 94.020 10,003 31,278 4,771 6,501 15,226 27,395 34,567 25,150 62,900 64,507 7,700 62,900 61,105 7,700 62,900 61,105 7,700 62,900 61,105 7,700 62,900 61,105 7,700 62,900 61,105 7,7000 7,7000 7,7000 7,7000 7,7000 7,7000 7,7000 7,7000	

* Official. G., gold : S., silver: L., lead ; C., copper. Silver valued by the different companies from \$1@\$1.2029 per ounce : gold, \$20.67. + Net. ‡ Not including value of lead and copper.

METALS.

NEW YORK, Friday Evening, March 6. Copper.—The statistical tables that we published last week have created a good deal of discussion, and cable answers have been received from London stating the Mansfeld stock at 2000 tons, say 4,500,000 pounds, instead of 33,000,000, as reported by Mr. Raunheim. This gentleman is at present absent from the city, but his informant is in as good a position as any one outside of the Mansfeld directors to know the facts, and we are inclined to think his figures are very near the truth.

The sensation of the week was the decline to-day in London (as cabled to the Metal Exchange) of Chili Bars to £46 17s. 6d., the lowest price on record, and one that must make even the rich Calumet & Hecla repent of its rash and unbusiness-like contract. If this price continues, our manufactur" ers will get their Lake copper at 10 cents, or cheaper than any of the inferior brands in the market. It will be strange if our manufacturers do not take full advantage of this anomalous condition of affairs. We may therefore expect to see the demand here increasing the consumption while these prices rule. At present the pool has difficulty in making deliveries. Best Selected in London to-day was £52, being unaffected by the fall in Chili Bars.

Messrs. Ledoux & Ricketts, of 10 Cedar street, New York, have issued a circular giving the production and consumption of copper. They consider that, as copper values have sunk to starvation level, there must follow a curtailment of production, and that this, coupled with 'he increased consumption that low prices are stimulating, must bring about a better state of things. We believe this result will take place, though it may not be attained speedily. Productive industries die as hard as a sturdy man attacked by disease. They account for the apparent stagnation of consumption in this country, to which Mr. Raunheim referred in his letter in our last issue, by emphasizing the fact that large stocks have been held up to this year, both by the Lake and Western companies or their creditors, all of which are now cleared off, and must be placed to the credit of home consumption.

The statistical position of copper in this country to-day is decidedly favorable. Stocks are comparatively small, and consumption large and no doubt increasing, while production appears to be stationary. If it were not for the Calumet & Hecla contract basing the price of Lake Copper on that of Chili Bars, our prices, and possibly Chili Bars, would be higher to-day. This arrangement for marketing our copper, it is safe to say, will never be repeated, and as it lasts only until May, we may look for a better market when it closes. We quote Lake Copper 11½@11¼c.; other brands

10½@11c. Lead.—There is a decidedly better feeling in this

market, and, though sales have been limited to 300 tons of Refined, the price obtained has been 3.70c., firm. Our St. Louis correspondent wires us to-day that there is a "boom" there. We quote : Domestic, 3.70c. The market firm, with an advancing tendency. Cables quote : Soft Spanish lead in London, £10 10s.,

as for some time past.

Messrs. John Wahl & Co., of St. Louis, telegraph us as follows to-day :

There has been a remarkable improvement in our market. Since our last report, sales of both hard and soft lead have been more free; between 600 and 700 tons of Desilverized and from 300 to 400 tons of Hard Lead were sold at 3.50c. Chemical sold at 3.40@ 3.421/2c. Market booming.

Messrs. Everett & Post, of Chicago, telegraph to us as follows to-day :

The market shows no improvement, but is rather on the decline. Sales of Common were made at 3.45@ 3.47c., and of Desilverized at 3.55c. Scarcely any thing is offered; there is but little doing, and demand is from hand to mouth only; but we anticipate a good trade during March and April.

Tin.—There has been a decline in the tin market. The closing prices in London, as cabled to the Metal Exchange, were £77 17s. 6d. spot, a decline during the day of 7s. 6d., and £78 12s. 6d. 3 months—a decline of 5s. We continue to quote here $16\frac{1}{2}$ @17c. spot.

The shipments in February were :

Straits : To Great Britain To America	,			 									• •							Tons. 1400 250
Australian : To Great Britain																				
To America				 * *	• •	•	• •	• •	• •	 • •	•	• •		• •	• •	•		• •	 *	50
Total Deliveries from	Loi	ado	m	 													 		 	2110
80 66	Ho	lla	nd																	500

Of which 500 tons were shipped to America.

Spelter.—Domestic, we quote 4.25@4.50c., according to quality, with the market dull and very little doing. There is still less doing in Foreign at 4.70c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, March 6. American Pig .-- There is nothing new to report : a steady consumption and a strictly corresponding demand ; consumers ordering only when their necessities absolutely demand it, and leaving the burden of carrying stock on the producer. Prices remain unchanged at \$18 for No. 1 Foundry ; \$17 for No. 2 ; and \$16 for Gray Forge, best Lehigh brands. The Metal Exchange reports for February are as follows: Anthracite furnaces 5 in blast, 26 out. Stocks, March 1st, 14,374 tons; production in February, 3320 tons ; bituminous furnaces, 9 in and 31 out of blast. Stocks, March 1st, 32,565 tons ; production in February, 16,707 tons ; charcoal furnaces, Stocks, March 1st, 12,220 3 in and 19 out of blast. tons ; production, 1137 tons. Totals-Stocks, March 1st, 59,159 tons, which is about 5300 tons less than February 1st, and production in February, 21,164 tons, which was 5000 tons more than in January.

Scotch Pig.-Not worth reporting. This business has almost disappeared. Prices are regularly cabled to

the Metal Exchange. Warrants to-day at Glasgow I were 41s. 6d., and No. 3 Middlesborough Iron 34s., while I the usual Scotch brands varied from 42s. 9d. for Eglinton to 54s. 6d. for Coltness. Here, prices remain as for some time past, from \$19@\$21, according to brand.

Steel Rails.—Dull ; inquiries are more numerous, but sales are few, and yet the asking prices are only \$27 at Eastern mills, and \$29@\$30 Chicago. The railroads need a good many daily for repairs, but they have no ready cash to buy with, and most of the producers now hold all the railroad paper they care to take. The improving business we are all confidently expecting in the near future may enable the roads to buy what they greatly need.

Philadelphia.

[From our Special Correspondent.]

The Eastern Pennsylvania iron trade has not picked up as much as was expected. General business has not improved much. Our local clearing-house returns do not show a general expansion in merchandise sales. Our manufacturing establishments are generally more active, making stuff for orders secured. In a general way, there is more confidence expressed in early prospects.

Pig-Iron.—To-day's quotations for best brands of No. 1 are \$18.50; No. 2, \$17.50; Gray Forge, \$16.50. There is plenty of iron offering at \$17, \$15.75, and \$15 respectively. There is a preference shown for commoner grades where it can be made to answer. The pig-iron makers are quietly waiting for what they have been all along predicting, a better trade, and seem to believe that it is bound to come, and give some very good reasons for their faith. Two or three furnaces are preparing to blow in, but so far as actual market facts are concerned, there is no improvement to note, and not much inquiry for future requirements, and a very careful filling of current requirements.

Foreign Material.—There is very little doing in Scotch Iron, Bessemer, or Spiegel. A small sale now and then is heard of, but buyers are purchasing only where there is no escape and jobbing around for bargains.

Muck-Bars.—The market has weakened about 50 cents, and even at that, there is not much demand.

Blooms.—Two or three bloomaries have gathered up orders for anthracite blooms, and it appears as though there was some prospect for improving trade in this direction. Coal has declined a little, and buyers are preparing to do something more.

Manufactured Iron.—Prices, as usual, gravitate, according to quality of stuff, all the way from \$1.50@\$1.80, with about \$1.65 and \$1.70 for most of the material-ordered. Mills in the interior are working along in a half-time sort of way, while in the city, there is only a moderate activity in the mills and very little to say as to what the next month will bring forth. The agents of mills are not fortunate in securing much spring and summer business as yet. They have strained every point and have made their very best offers.

Nails.—Nails hold up well, and to all appearances will not weaken. There is no accumulation of stock, although some makers are making more than they are getting rid of ; but the apparent accumulation is simply discounting a demand that will probably come along. Builders are preparing for a great deal of work, and cellars for several hundred houses will be dug just as soon as the weather permits.

Merchant Steel.—Merchant steel men report a good demand.

Sheet Iron.-Mills are doing better.

Wrought Pipe.—Several inquiries are in hand for wrought pipe, and negotiations, it is expected, will be closed this week, at very nearly the trade discounts. *Cast Pipe.*—Negotiations are pending for consider-

able cast pipe for water purposes. *Plate and Tank-Iron.*—There is but a moderate demand, and no change in prices.

Structural Iron.—Small lots of bridge iron are selling. Angles are 2c. ; Tees, \$2.50 ; Beams and Channels, 3c.

Steel Rails.—It has been rumored that there have been sales of steel rails at \$25.50 in one Pennsylvania mill; but the quoted prices are \$26.50@\$27 for large lots and \$27.50 for small lots. There is some inquiry for light sections.

Old Rails.—There is a good deal of old rail material wanted at about \$17@\$17.50. Holders are a little nigher.

Scrap .- A good deal of scrap has been delivered to

mills and holders are firm in prices for selected stuff, Every thing else is very cheap.

> Louisville. March 3. [Reported by GEORGE H. HULL & Co.]

The market for pig-iron is quiet but firm, with a good demand for this time of the year. We quote for cash in round lots as below :

e PIG-IRON

B

outhern Coke No. 1, Foundry	\$16.75@\$17.50 15.75@ 16.50	
langing Rock Coke, No. 1, Foundry	16.00@ 17.00	
" " Charcoal, No. 1, Foundry	21.00@ 21.50	
outhern Charcoal, No. 1, Foundry	18.00@ 19.00	
ilver Gray, different grades	15.00@ 18.00	
outhern Coke, No. 1 Mill, Neutral	13.75@ 14.50	
" No. 2 " "	13.25@ 13.50	
" No. 1 " Cold Short	13.00@ 13.50	
" Charcoal, No. 1 Mill	16.00@ 17.00	
Vhite and Mottled, different grades	12.00@ 13.00	
outhern Car-Wheel, Standard Brands	25.00@ 26.00	
" Other "	20.00@ 22.00	
langing Rock, Cold Blast	24.00@ 25.00	
" Warm Blast	20.00@ 21.00	

Pittsburg.

The iron market in Pittsburg is dull. The sales announced in our last week's issue were peremptory sales of hypothecated iron, and the effect was depressing on the market.

Prices are quoted regular, as follows :

No. 1 Foundry	18.00	4 mos
No. ? Foundry 16@	16.50	46.1
Gray Forge 15@	15.50	6.6
White and Mottled	15.25	86
Bessemer	18.00	6.6
Cold-blast Charcoal 2.00		
Warm-blast Charcoal 20@		

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 6. Anthracite. The production of anthracite for the past week was

The production of anthracite for the past week was 341,074 tons, and from January 1st, 3,050,083 tons, being a decrease, as compared with last year, of 620,037 tons. This, with the steady large demand for domestic sizes, has helped the market. The milder weather of this week has opened the shipping ports and reduced the demand, so that the market at present is weaker than for some time, and, as a consequence, prices are shaded.

We may quote as fair current selling prices, \$3.25 for Broken ; \$3.20 for Egg ; \$4 for Stove ; \$3.50 for Chestnut, and \$2.50 for Pea, f. o. b.-for prompt purchasers. Some of the companies quote from 25 to 30 cents above these prices for free-burning coals, but, on the other hand, we hear of sales of good Stove coal below \$4. The market is decidedly weaker ; but a strict adherence to the quota ordered for March and the probability of some cold weather still this month make it probable that trade will continue fair through the month. Stocks are everywhere low, and orders are, as a rule, for immediate delivery, consumers having no stock. In short, the market is in an excellent condition, and the increasing consumption that we are justified in looking for before very long should keep it so and make the trade satisfactory to producers

Bituminous.

There is very little new to note in this article. The pool is still preaching pool prices and practicing pool ethics. To those who believe in the maintenance of these prices, there is no inducement to buy, because they can get the same rates when they want the coal, while unbelievers think they can do better by waiting. The Chesapeake & Ohio Canal will open the 15th,

The Chesapeake & Ohio Canal will open the 15th, or soon after, and that will give Cumberland sellers a chance to make contracts unrestricted by pool agreements. The Norfolk & Western and Chesapeake & Ohio coals are actively pushed, and have taken a number of contracts. Beech Creek (Vanderbilt) has also taken its full share of the trade.

The production of bituminous coal for the week past was 156,466 tons, and from January 1st 1,288,555 tons, being about the same amount as to the same date last year.

We continue to quote pool prices: \$2.70, Baltimore; \$2.80, Philadelphia; \$3.25, New York; \$3.50, Boston f. o. b. Freights from Philadelphia and Baltimore to Boston are about \$1.50, and to Sound ports \$1.35 per ton.

Philadelphia. March 6.

[From our Special Correspondent.] The local anthracite coal trade is in excellent condition. Harmony reigns in the great household. The backbone of winter is broken, and warmer weather is at hand. Domestic sizes are in active demand, and no shading of prices is known. Retail requirements are

heavy. Hopefulness has taken the place of distrust

NEW YORK MINING STOCKS. DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

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Tables giving dividends and assessments will be printed the first week of each month. Dividend shares sold, 52.578. Non-dividend shares sold, 49.150.

The regions are hard at work, and it is believed that | road at Harrisburg, or, strictly speaking, its annex. | local correspondent may obtain particulars in time for they will work full-time toward the latter end of the month. At the same time, there are disquieting rumors concerning the rates at which some large contracts are placed. The Reading and Lehigh Valley tolls are now both \$1.60 to this city. The line trade shows prospects of improvement. Advices from outside markets are various. From Boston comes the word that, when every thing was frozen up, people were anxious to contract for season requirements. A good many buyers have been visited since the advent of softer weather, and they did not care to buy until late in March, as they thought their stocks would last, illustrating the old-time lines, "The devil was sick, the devil a monk would be ; the devil got well, the devil a monk was he." The secret of this delay is found to be a belief in a general break in freight rates. To-day, rates are \$1.50, and two or three vessels are under charter preparing to start. One started yesterday, and vessels are called for at a dozen offices. There is, after all, a good deal of coal wanted, but it does not represent the full volume. If freights drop to \$1.15@\$1.20, there will be a lively business in coal. Vessel-owners are not anxious to take the risks just at this time. The harbor is uncomfortably full of ice. Advices to-day from Western markets are unimportant, except that stocks are lower. According to the resolution passed at the meeting of the Western anthracite interests at New York, on the 26th ult., a committee of five, Messrs. Slee, Sayre, Holden, Richards, and Albright, met here this afternoon at the Hotel Lafayette, and formulated certain plans for the better management of the Western anthracite interests.

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To-day's settlement and formulation of plans will open an active trade in Western markets, where there has been an enormous consumption, especially for household uses. That outlet will help to harden prices in more sluggish Eastern markets. Southern orders are under way, and a large amount of business will be done in South Atlantic ports. Everywhere, there are expressions of improving prospects and greater confi-

The bituminous trade is in a lethargic condition, except for those who enjoy special rates. Nothing is likely to be accomplished of a satisfactory nature in for the coming season's business, to be reported at the the legislative department of the Pennsylvania Rail next general meeting for approval. Probably your Buchanan, of the New York Central Railroad.

The merchants and manufacturers have gone before demonstrating the extent of the wrong done, directly and indirectly, by discrimination ; but the crying evil The pool rates, \$2.70 for Baltimore, is not abated. \$2.80 for Philadelphia, \$3.25 for New York, and \$3.50 for Boston, allow about 80 cents a ton when freight charges are taken out, according to the terms entered into, provided coal is sold at certain Out of 80 cents, come 40 cents to "made" prices. the miner, from 12 to 15 cents royalty, loss, inside and outside labor, interest, and loss from depreciation. In short, the pool rates are made like the cup of Tantalus. No honest business can be conducted on an 80-cent margin. No large legitimate bituminous contracts are made, but large private contracts by favored parties, it is believed, have been made, which will be announced later on-at the right time. The Clearfield operators have become accustomed to hanging by their eyelids. The usual amount of coal is mined and shipped.

In the Clearfield region, there are mines opened at large expense, and which could be made to run from 500 to 1000 tons a day, which are idle. There are many operators running to prevent deterioration of plant, to hold on to miners, and to take their chances of better days. Last week's Clearfield shipments were 64,132 tons, against 45,027 tons for the same week last year. So far this season, 463,896 tons have been shipped, against 433,319 tons, an increase this year of 30,579 tons.

The impossibility of obtaining uniform rates will it is to be hoped, not be one of this year's coal trade evils, although it is believed that coal has been sold in large blocks below pool figures. The coal commissioner will have it in his power to prevent the doing of injustice to the smaller and individual operators.

Buffalo.

[From our Special Correspondent.]

At the last meeting of the Joint Western Anthracite Coal Committee, it was determined that no change in prices should be made in New York State and at West-ern points during March. The sub-committee will The sub-committee will meet at Philadelphia this week to arrange a programme

your issue of the 7th instant-if such leak out. It is committees there, with long tables of figures and facts not worth while to give the impressions prevailing among the trade here as to the plan to be recommended.

> There was a large attendance of the coal men at the Merchants' Exchange last Monday. The meeting was interesting, and the result was a recommendation to the trustees asking that Messrs. T. Guilford Smith, Andrew Langdon, H. A. Nobles, F. A. Bell, and J. J. McWilliams be the coal committee for the current year. It was also decided that all members interested in the coal trade, whether miners, shippers, dealers, etc., should meet daily to interchange views, contract for vessels, and "promote the welfare of the craft" generally. Thus far the plan has worked well, a large number of coal men putting in an appearance about noon and mingling with the grain, lumber, commission, and railroad men and merchants of all the various branches of commerce represented on 'Change. As the season advances, it is expected that what now is a pleasant duty will prove to be a beneficial necessity.

> Shippers' and carriers' views regarding lake freight rates for the coming season differ widely, and very little contract chartering has been done in consequence. In coal, as far as can be learned, not a single engagement has been made. It is reported that an ore contract from Escanaba to Cleveland was arranged at \$1.05, and another at 95 cents ; the latter figures are doubted. The slim prospects of an early opening of navigation may be judged from the fact that the ice extends nearly over the entire surface of Lake Erie, and for miles from shore here it is fully twenty-four inches thick. A look over Lake Erie from elevated points is suggestive of the Arctic regions, lacking the icebergs.

> There is nothing new in the local trade for coal and coke. The charity organizations and benevolent societies are providing our unemployed workmen with work until spring opens, thus relieving them from the stigma of " pauperism."

> Coal stealing from cars has been very prevalent here this winter : many men and women have been fined, and the evil in some degree thus abated.

> Three tons of coal are said to be saved each trip from Buffalo to Syracuse by the use of the new smoke-consumer that has been invented by Superintendent

New Orleans.

March 2.

March 5.

[Reported by C. A. MILTENBERGER & Co.] The demand for coal, both for steam and family purposes, during February, has been quite brisk, the severe weather giving an impetus to the latter department of the trade. Retail prices continue firm, giving the dealers a good working margin over wholesale rates. Notwithstanding the small stock of Pittsburg on hand, wholesale prices have still further declined, 26@28c. per barrel being the market figures by boat or bargeload. Without a good navigable river above that will continue into the summer, it will be next to impossible for the shippers of coal to build up a sufficient stock of Pittsburg to fill the demand during the dry seaon when the upper rivers are sure to be below the boating stage.

Boston. [From our Special Correspondent.]

The market for anthracite is active, and wholesale dealers are having all the trade they can attend to. They can not attend to very much, however, owing to the small amount of coal for shipment, and also to the scarcity of vessels and to the severe weather, which has delayed deliveries. Boston retailers, as well as those in this vicinity, have a very small stock for their trade, and some dealers are reported entirely cleaned out. We are just beginning to feel the demand from call those parties who buy in larger quantities in the fall or early winter months, and whose bins are emptied earlier than usual, owing to the continued cold weather. For this reason, it looks as if there would be no difficulty in maintaining \$4 f. o. b. at New York for Stove, at least during March ; and while the allotment plan was adhered to in February, it looks like full mining time for March.

Prices are now regulated by facilities for shipment. We hear of \$4.20@\$4.25 f. o. b. at New York for Stove available for immediate shipment, while \$4,15 has been a reasonable figure. Price has been of secondary importance to prompt delivery. Pocket dealers have had an active trade from the small dealers, at \$5,50@\$5,75 for Stove : \$4.85@\$5 for Broken and Egg ; and \$6.85 for Lykens Valley Stove. The scarcity has called them to ship coal in all directions

F. o. b. prices are as follows :

At New York, Stove, \$4.10@\$4.25; Egg, \$3.50; Broken, \$3.35@\$3.50; Pea, \$2.25@\$2.50; Nut, \$3.35 @\$3.50. At Philadelphia, \$3.90@\$4 for Stove; \$3.25 @\$3.50 for Egg; \$2 for Pea; \$3@\$3.15 for Broken. Special coals, \$4.75@\$5 for Broken, \$5.35@\$5.50 for Stove.

Pennsylvania Railroad prices are looked for on the 6th inst.

There has been less activity among the bituminous dealers this week. Nearly all contracts that are to come early have been cared for by this time. It is reported that the Maine Central has bought 50,000 tons of Clearfield coal. The railroads are now about out of the market. Just how the Boston & Maine contract is placed is not definitely known. It is said that 28,000 tons have been taken by the Chesapeake & Ohio people for Portland delivery ; but as for the remainder and the share that the Norfolk & Western people have in it, we can not say.

The sugar refineries are not buying, but are holding off, and only a few paper manufacturers have bought. The Merrimack Manufacturing Company has bought 20,000 tons of Clearfield, as last year. As for the pool, there are no new developments. It has a restraining influence on some, and particularly on some of the shippers over the Baltimore & Ohio. Some of these latter have sold hardly any coal this season who had contracted for from 75,000 to 100,000 tons up to March 1st last year. They have lost the business because bids from five to fifteen cents below their lowest figures were made. Some of the Clearfield shippers are apparently in the same box. There is still a large tonnage to be placed in small lots of from 2000 to 5000 tons. Buyers who do not need coal are offering \$3.25 delivered, but it is doubtful whether this figure is granted them.

Cargo lots are selling at \$3,60@\$3.70 delivered.

The advanced figures noted in freight quotations are firmly held, and, as considerable coal must come forward, these figures are likely to be maintained. We hear of \$1.25 offered for season charters from Balti-more, but do not learn of any contracts made at this figure. The contract rate last year was \$1.40, although \$1.25 was a current rate for a large part of the season. This allowed shippers to get out whole on

their low contracts. If \$1.25 from Baltimore was to be the rate this year, it would make Philadelphia \$1.15 and New York \$1.00. These figures are not improbable, but skippers will not hasten to make contracts on such a low and unremunerative basis. We quote

New York, \$1.25@\$1.30; Philadelphia, \$1.50; Baltimore, \$1.50@\$1.60; Newport News, \$1.35; Richmond, \$1.40@\$1.45; Cape Breton, -@-; Bay of Fundy, -@-

Retail trade is active, and the advance noted pre-viously is held. Wharf prices are also advanced. Dealers are satisfied if they can take care of their regular trade just now. We quote :

 lar trade just now.
 we quote :

 White ash, furnace and egg.
 \$5.250 \$5.75

 " stove and nut
 5.50@ 6.00

 Sham bkin, egg
 6.00@ 6.25

 " stove
 6.25@ 6.50

 forberry, egg and stove
 6.50@ 7.00

 Franklin, egg and stove
 5.50@ 6.00

 Lehigh, furnace, egg, and stove
 5.50@ 6.50

 " nut.
 5.75@ 6.50

Wharf prices : Stove, \$5; Broken and Egg, \$4.75.

STATISTICS OF COAL PRODUCTION.

Comparative statement of the production of anthracite al for the week ended February 28th, and year from muary 1st :

1 - un an 0040	1	885.	18	84.
1 ONS OF 2240 LES.	Week.	Year.	Week.	Year.
D. & H. Canal Co.	51,108	405,922	73.297	463,772
D., L. & W. RR. Co.	99,730	537,498	89,737	670,557
Penna. Coal Co	*	78,083	13,544	141,633
L. V. RR. Co	5,909	156,500	29,642	194,777
P. & N. Y. RR. Co. North & West Br.	574	16,285	3,254	27,410
RR	16,903	172,167	14,199	130,801
L. V. RR. Co	26,833	466.342	71.975	616,48
S. H. & W. B. RR.	2.851	18,754	3.164	31,190
P. & R. RR. Co	134,942	1.184.428	155,372	1,380,854
-t Line&Sul.RR.Co.	2,224	14,104	1,492	12,62
Total	341,074	3,050,083	455,676	3,670,11
Increase.				
Decrease		620,037		
The above table d samed and sold at t o° the whole produc	he mines			
Total same time in				3,493 tons 0,900 "
64 66 66 66	1889			9,839 **
66 66 66 6E	1883		4,05	4,563 "
The decrease in s Cumberland & P	hipments ennsylvan	nia Railro	ad and	branche

amounts to 2.298 tons, as compared with the corre-sponding period of 1884.

Belvidere-Delaware Railroad Report for the week ended February 28th :

	Week.	Year 1884.	Year 1885.
Coal for shipment at Coal Port (Trenton)		1,028	
Amboy 'oal for distribution Coal for company's use	5,906 16,274 3,652	69,574 122,016 36,532	84,627 134,137 31,286
Total	25,832	229,170	250,050
Increase		20,880	

Comparative Statement of the Production of Bituminous Coal for the week ended February 28th, and year from January 1st :

Tons of 2000 pou	nds, unl	ess otherwi	se design	ated.
		85		84
	Week.		Week.	
Cumberland Regio Tons of 2240 lbs	n. Md. 21,827	268,233	30,924	264,315
Barclay Region, I Sarclay RR., tons of 2240 lbs		44,754	4,869	60,025
Broad Top Region Huntington & Broad Top RK., tons of 2:240 lbs	2,809	24,085	3,108	30,987
East Broad Top	*****			
Clearfield Region, Snow Shoe Karthaus (Keating) Fyrone & Clearfield	4,586 2,623	34,400 31,165 491,501		
Alleghany Region, Gallıtzin & Moun- tain	10,601	80,877	8,705	79,628
Pittsburg Region, West Penn RR SouthwestPenn.RR. Pennsylvania RR	4,545 2.058	41,546 17,412 36,228		27,558
Westmoreland Re Pennsylvania RR Monongahela Regi	21,653 ion, Pa.	182,917	29,469	210,211
Pennsylvania RR	6,934	35,433	3,688	28,787
-	Contraction of Contra	spanning of the local division of	-	the summer is not the

11

TOND OF MOOD DOG	111111			
*		85		884
	Week.	Year.	Week.	Year.
Gallitzin & Moun- tain (Alleghany				
Region)	3,614	30,728	2,337	22,591
West Penn. RR	635	1,241	1,678	20,741
Southwest Penn.				
RR	35,498	288,246	37.525	360,035
Penn. & West- moreland Re-				
gion, Pa. RR	6,133	44,589	4.044	34,228
Monongahela.				
Penn. RR	1.100	10.623	1.258	13,088
Pittsburg Region,	-,		-,	101000
Pa. R.K			17	102
Snow Shoe (Clear-				
field Region)	240	3,157	385	4,153
Total	47.250	378,584	47.244	454,938
Decrease		76,354		

FREIGHTS.

Coastwise Freights.

Per ton of 2240 los. Representing the latest actual charters to March 6th

[†] ORTB.	From Philadelphia,	From Baltimore.	From Elizabethport, Port Johnston, South Am boy, Hoboken, and Weebawken.
Alexandria Annapolis Albany Baltimore Bangor	.90		
Annapolis			**************
Baltimore			
Bangor		********	***********
Beverly			**************
Boston, Mass	1.40@1.50	1.50	1.25
Bangor. Bath. Me Boston, Mass. Bristol Bridgeport, Conn. Brooklyn Buffalo, N. Y. Jambridge, Mass. Jambridge, Mass. Jambridge, Mass. Jambridgen, Mas		1.30	
Brooklyn		1.30	
ambridge, Mass.			
Cambridgeport			
Charleston, S. C.	1.10@1.15	1.30	**********
Chelsea			
City Point			
E. Boston.			
East Cambridge.	**** ********	*****	
Fall River		1.40	* * * * * * * * * * * * * * *
All restor, S. C. harlestown. Leisea. City Point. Com. Pt., Mass. Com. Pt., Mass. East Cambridge. E. Gr'nwich, R. I. Fall River. Salveston. Sardiner, Me. Seorgetown, D. C. Sloucester. Halfax. Heartford			****** ****
Jardiner, Me	.90	**********	*********
Houcester			
Halifax		•••••	
Hackensack			
Hartford Hackensack Hudson	**** ** *****	** ********	
Marblehead			
Medford			
Milton			
Newark, N. J		****** ******	
Newburyport	********		
New Haven		1.30	
Marbiehead Marbiehead Welford Willville, N. J. New Bedford New London New Dorleans. New Dorleans. New Porte. New Port. New York. Norfolk, Va. Norwich. Norwich. Norwak, Conn. Pawtucket. Philadeibbia.	**********	********* ****	
New-Berne		1.25	
Newport		1.25	
Norfolk, Va	.70		
Norwich		*******	
Pawtucket			
Norwalk, Conn. Pawtucket. Poliadelphia. Fortiand, Me. Portsmouth, Va. Portsmouth, N.H. Providence. Quincy Foint. Richmond, Va. Rockland, Me. Rockland, Me. Rockport Roxbury, Mass.	1.25*	1.50	********
Portsmouth, Va			
Portsmouth, N.H. Providence	1.15@1.95	1.40	.80@1.00
Quincy Point			
Richmond, Va	.70@.80		************
Rockport			
Roxbury, Mass			
Sag Uashos		*****	*************
Salem, mass			
Saugus Savannah		1.50	
Somerset		1.40 1.10	
Staten Island		1.10	
Troy			
Wareham			************
Weymouth			***********
Williamsbg, N.Y.		1.30	
Staten Island Trenton Troy		1.25	************
St. Thomas, W. I.			