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PROF. WILLIAM P. BLAKE, mining engineer, is at present in Montana, on professional business, and may, until the end of the month, be addressed at Butte City, Montana.

### THE SILVER DOLLAR QUESTION.

A great deal has recently been said in the newspapers concerning the suspension of the obligatory silver dollar coinage act, under which at least two millions of 412½ grain silver dollars are coined each month.

We give elsewhere (from the New York Herald) the full text of the proposed Warner silver bill, and shall be pleased to give space for the views—briefly expressed—of those who advocate and those who oppose it. Some of the principal objections to it are:

1. It makes the purchases of silver by the government and its issue of silver certificates unlimited.
2. It makes the government simply a great silver broker, obliged to

take all the silver offered at more than its gold market value; for no one will deposit silver and take silver certificates for it when the gold market value of silver is equal to or greater than the government price, which is based on the average price of the day or month before purchase. Thus, under this law, any one could to-day get silver certificates for an unlimited amount of silver at about \$1.02½ an ounce, the average price in August, while he could not sell for gold in the market at more than about \$1.06½ an ounce. The government would always have to buy above the market and sell below it.

3. Why this business should be confined to silver bullion and not be extended to lead, or copper, nickel, or any other metal, will always prove a source of complaint among producers.

We shall return to the subject next week.

### ASSAYS AT THE MINTS.

Dr. J. P. KIMBALL, the new Director of the Mint, has issued an order, forbidding the practice of making private assays and analyses, or pulverizing minerals for such purposes, at the mints and assay-offices of the United States, or the laboratory of the Bureau of the Mint at Washington. Whatever work of this kind is done in a private professional capacity by United States officers must not hereafter be done upon the government premises; professionals cards and certificates must be without official captions or signatures, and no professional signs will be permitted to be displayed in the mints and assay-offices.

This order puts an end to an evil which has been seriously felt by private chemists and assayers, namely, the competition of government officials. These gentlemen, assured already of a living, and using to a greater or less extent the plant and materials of the United States, have been able (and often not unwilling) to take work at lower rates than would keep private practitioners alive. The price of gold and silver assays has thus been reduced in many instances to \$1 each; in other words, by the help of the government, retail business has been done at wholesale, or even less than wholesale, rates. We do not say that materials belonging to the government have been actually consumed in this way for private profit; though the line is hard to draw, and easy to cross. The government pulverizer being in operation, with capacity to spare, why not crush a few pounds of private material for assay, at no tangible extra cost to the government? Or, the assay-furnaces being hot, why not set in a cupel or a crucible, to get the benefit of the heat that is going to waste? Or, why not use a beaker or a funnel, which will be none the worse for it? Of course, there would be no harm in weighing on the official scales, or seeing customers in the official building, rent free, or allowing the official position to advertise, in an incidental way, the private business! Honest officers would go no farther than this; less scrupulous ones would perhaps find it easy to forget to pay for breakages, or odd trifles of charcoal and acid. But whether the government is distinctly wronged or not, the private assayer, who has to pay his own rent, buy his own apparatus, and advertise his own business, has ground of complaint.

The evil has another aspect. The processes of the mints and assay-offices require skill and integrity, it is true; but they do not require a wide metallurgical and chemical knowledge. Among the officials employed, there are many who possess such knowledge, and are therefore qualified to give advice or perform analytical work in many departments. But those who are not so qualified are apt to do it also; and this reflects unnecessary discredit upon the Mint. We have heard of a case in which the incumbent of a Western office made requisition for a lot of chemical apparatus, amounting to some \$1500, and naïvely observed, in support of this requisition, that the lack of the apparatus specified was probably the reason that the chemical analyses of his office had been hitherto held in contempt by the public.

Under the new order, those officials who are competent general metallurgists and chemists can continue their general practice; only, they must do it in their own laboratories, on their own private merits, and wholly at their own expense. This is as it should be.

### THE GATHERING OF THE CLANS.

#### A Reminiscence of the Halifax Meeting.

##### I.

Who hath not felt his pulses stirred  
By Scotia's matchless song,  
That tells how, at a magic word,  
The Highland warriors throng;

How James Fitzjames and Roderick Dhu  
The mountain echoes wake;  
How Malcolm finds his Ellen true,  
The Lady of the Lake?

Sir Walter sleeps; the tuneful strain  
Must be some other man's,  
How a new Scotia saw again  
The gathering of the clans.

## II.

Quoth Leckie, "Lo! how many a spot  
The Institute has had,  
While Nova Scotia knew it not—  
Now, Jamme, that's too bad!"

Hence came the call; and them who called  
No hearer could resist:  
It was Sir Adams Archibald  
That led the shining list.

To bear the blazing cross on high  
No breathless heralds ran,  
Calling to death or victory  
Each eager chief and clan.

The times are altered—who shall say  
Whether for gain or loss?  
And we sent forth, the other day,  
A circular, not a cross.

Nor was its message one of war  
On peaceful regions loosed:  
It spoke of free excursions, or  
Of railway-fares reduced;

Of passes, not like that the king  
Held against Roderick bold,  
But a more peaceful sort of thing,  
And easier far to hold!

## III.

Not merely Fitzes, O's, and Mac's,  
With claymores, shields, and spears,  
They marched in hosts on Halifax—  
The Mining Engineers!

Some sailed through ocean's wave and haze,  
And some by railroad came;  
And some arrived by unknown ways,  
But "got there all the same."

Yet not for conquest or defense  
These peaceful warriors ran so,  
O'erflowing all St. John, and thence  
Beyond the Strait of Canso.

Nor did they come with sordid view,  
While others' blood ran red,  
Like those old canny Scotsmen who  
Weighed hay while "Wallace bled!"

Nor war, nor trade, nor politics  
Had occupied their wits—  
With Tories they were glad to mix,  
Although they liked the "Grits."

Thus upon cordial Halifax  
Their armies did descend,  
As streams flow down the mountain backs,  
As friend comes down on friend!

## IV.

They sailed the harbor wide and fair—  
And here the bard may add,  
They boarded with a dauntless air  
The Admiral's iron-clad.

They saw the fireworks in the Park  
And listened to the band;  
Anon, they talked with men of mark,  
And shook the Mayor's hand.

Amazed they viewed the riches hid  
In the New Albion mines;  
I can not tell you all they did,  
In these restricted lines.

Then the clans scattered. Certain hied  
With Jamme to make merry;  
No famine they did find inside,  
When they took Londonderry!

And they who unto Springhill went  
Loud of their banquet boast,  
Where Bayles did the eloquent,  
And Leckie was the host.

And many a knight made up his mind  
The Breton trip to take,  
Because he brought—or hoped to find—  
A Lady of the Lake.

How these did fare, we know not yet;  
And we can only guess,  
The lakes were rather cold and wet,  
The ladies felt distress.

But happy they whom Laurie led,  
With Innes for a guide  
(The heavens unclouded overhead,  
Fair fields on either side).

Through famous Windsor's quarries white,  
And Grandpré's peaceful fold,  
And where was once Port Royal—site  
Of mighty deeds of old!

I ween, that sunset-serenade  
Will never be forgot,  
The band—and eke the piper—played  
In camp at Aldershot!

## V.

O Friends, who seem no longer new!  
One thing we bid you know:  
If it was hard to get to you,  
'Tis harder far to go!

He breathes a blessing and a sigh  
Who from your shores departs,  
On the fair land and sea and sky,  
Where dwell such generous hearts! \*

## CORRESPONDENCE.

[We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested. All letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.]

## Water-Jackets.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: On page 268 of *Mineral Resources of the United States*, 1883, in the article on Copper, by Mr. James Douglas, Jr., the following may be found:

... "Neither the water-jacket nor the well can lay claim to be American inventions. Mr. John Williams, since so well known in this country, built in 1852, near Drontheim, Norway, sectional water-jacketed furnaces, consisting of a circle of long, narrow water-backs, perforated by tuyere-holes. In these furnaces, he also used the germ of the modern outer well, by flowing the entire charge continuously from the furnace through an aperture two inches below the tuyeres into an outer sump inclosed in iron plates, in which the separation of slag and matte took place. Water furnaces were long used at the lead-works of Pont Gibaud, France, and were introduced thence by Mr. Rickard into the Richmond Company's works, at Eureka, Nevada. Smelting in water-jackets received a great impulse when, in 1873, Messrs. Daggett, at the Winnemuck, and Williams, at the Flagstaff, on lead, and at the Copperopolis mine, on copper carbonate, erected water-jackets; but the present familiar type of water-jacket was planned and first erected at the Blue Bell mine by Mr. Lewis Williams."

In 1875, the writer erected probably the first water-jacket furnace put up for smelting copper ores on this coast, although short water-jackets had been in use for some years previous in the smelting of lead ores.

SAN FRANCISCO, CAL., AUG. 31.

J. J. WILLIAMS.

## The Cost of Mining Machinery.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Mining is a great industry, but there are many impediments to pursuing it. Among the principal of these is the excessive cost of machinery. The chief end of foundry-men would seem to be to sell their iron first, and machines afterward. Certain it is that many mining implements are made to weigh five or six times more than the work they are expected to do would seem to render necessary. Latterly, various machines of light weight have been put on the market, but the prices are fully up to the old standard. I know of one amalgamator that could not have cost \$500, for which \$8000 is asked. For mills that are advertised as weighing two or three tons, and that are very simple in construction, \$5000 or \$6000 are demanded. This is simply ridiculous. We all know the price of labor and iron, and we are not going to give manufacturers thirty or forty times the cost of any article. Let them be satisfied with a fair profit—three or four hundred per cent, say—and then we have no doubt they will be liberally patronized, and the mining industry of the country wonderfully stimulated. Please publish in the interest of common sense and fair play.

SAN FRANCISCO, CAL.

MANY MINERS.

[If our correspondent had written to any of the first-class manufacturers whose advertisements are in the ENGINEERING AND MINING JOURNAL, he would have been treated reasonably, and no such figures as he mentions would have been asked. He must have fallen into the hands of some irresponsible dealer.—ED. E. AND M. J.]

**Test for Leather for Belting.**—For testing the quality of the leather used for belting, M. Eitner proposes, in the *Revue Industrielle*, the following simple method: A small piece is cut out of the belt and placed in vinegar. If the leather has been perfectly tanned, and is therefore of good quality, it will remain immersed in the vinegar, even for several months, without any other change than becoming of a little darker color. If, on the contrary, it is not well impregnated with tannin, the fibers will promptly swell, and, after a short time, be converted into a gelatinous mass.

**Average Price Per Ton of English Pig-Lead in London.**—The average price in London, from 1860 to 1885, was:

	£	s.	d.		£	s.	d.
1860	22	6	3	1873	23	6	0
1861	21	0	4	1874	22	2	0
1862	20	16	3	1875	22	9	4
1863	20	16	0	1876	21	13	0
1864	21	12	0	1877	20	11	3
1865	20	2	0	1878	18	14	0
1866	20	10	0	1879	14	16	6
1867	19	11	0	1880	16	7	6
1868	19	6	6	1881	14	19	3
1869	19	11	6	1882	14	7	3
1870	18	13	0	1883	12	18	0
1871	18	4	0	1884	11	16	0
1872	20	0	0	Feb. 27, 1885	10	15	0

The price of lead is less than half what it was in 1875, and more than 50 per cent less than it was in 1880.



## THE HALIFAX (N. S.) MEETING OF THE AMERICAN INSTITUTE OF MINING ENGINEERS.—I.

The meeting of the Institute, which was opened in Halifax, Nova Scotia, on the 15th inst., was moderately well attended, though probably fully 120 members were present. As but parts of two days were devoted to the reading and discussion of papers, only a few of the large number presented were read. The arrangements for the meeting and for the entertainment and comfort of the members were simply perfect, and the hospitality with which the Institute was received and entertained makes the meeting memorable. Elsewhere we refer to the social aspects of the meeting; in this place, we shall refer simply to its "business" features.

The meeting was opened September 16th by a cordial and eloquent welcome to the Institute by Sir Adams G. Archibald, K.C.M.G. We regret that our limited space will not allow us to give the addresses and papers in full; but we quote a few paragraphs from Sir Adams Archibald's welcoming address:

"We welcome you on various grounds. If you had come on the visit merely as citizens of a friendly country, we should have been delighted to see you. You are connected with us by so many ties, the ties of a common lineage and a common language, a common literature and common traditions. You are sharers with us and the parent country in common political and judicial institutions, and in a fullness of freedom such as exists nowhere else in the world. Had you come, therefore, with these claims only on us, we should have been delighted with the opportunity of showing the gratification your visit would confer. You come, indeed, with all these claims on our regard, but you have others still. We welcome you on these grounds, but we welcome you also—some of you as representatives of great industries in your own country—others as men of special skill and science, who have made your names household words everywhere. All of you are welcome as connected with a profession which has done more, perhaps, than any other to promote improvements in the material condition of the world.

"It has been the task of that profession to grope in the bowels of the earth for the treasures that nature has hidden there, to clear them from the dross with which they are associated, to prepare and purify them for the use and comfort of man. You have had to organize inert matter, to put it into shapes and forms by which it could be utilized—so as first to create and then to direct a motive power—and thus making matter the slave of mind, to perform prodigies of power and endurance and speed which have revolutionized the world. We welcome you, therefore, as gentlemen connected with this great profession.

"But besides all this, we may have an *arrière pensée* not quite unselfish. We know that your visit will give us pleasure. May we be pardoned for entertaining the idea that it may also profit us in the result?"

"We claim in this province to be possessed of large mineral treasures. I do not refer to the gold and the silver, the royal minerals, because whether we have them or not is a matter of comparatively small importance to our country. But as regards those minerals which everywhere form the basis of national prosperity, those which are of absolute necessity and universal use—iron and coal; these we have unquestionably in great abundance and of excellent quality."

Sir Adams then gave a sketch of the familiar history of the grant of all the minerals of Nova Scotia and Cape Breton to the Duke of York, or, more properly, to his creditors, in 1826. For thirty years (half the term of the original grant or lease), the Mining Association held the minerals of the province back from development, and it was only in 1857, after years of wordy war, that the Association gave up its claim to all the minerals except the coal in certain small areas. The legislature then vested in the owners of the lands all the minerals except gold and silver, lead, copper, coal, tin, and precious stones. Under this agreement, mines have been opened in every part of the province. There are collieries actually worked in six of the eighteen counties into which the province is divided. Gold mines have been opened in twelve proclaimed districts in six counties, and in other districts not proclaimed in other counties. Already over one hundred coal leases have passed the great seal, and the leases of gold mines are innumerable.

The royalties reserved are 10 cents a ton on coal; iron, 3 cents a ton on the ore; gold, 2 per cent; and all other minerals 5 per cent. These royalties go to form a fund for the support of the local government, which derives in one way or another over \$100,000 a year from this source.

"While the freeing of our mines from the monopoly of the association gave an immense impulse to them, the fiscal policy which had governed our relations with the United States has tended to retard the development of our coal interests. From 1854 to 1866, our coal was admitted into the United States free of duty. When the reciprocity treaty was repealed, two thirds of our entire sales were made to that country. After that, the States imposed a duty of \$1.25 a ton. This soon reduced our exportations to that country. The trade in six years dwindled from two thirds to one fifteenth of our whole sales. Then the duty was reduced to seventy-five cents. But the trade continued to dwindle till in 1884, instead of being two thirds, it fell to one twentieth of our entire sales. But in the mean time our total sales, notwithstanding the reduction in, or rather the extinction of, the sales to the United States, have gone on increasing from year to year, and last year we sold well on to 500,000 tons more than we did when our trade with the States was in the most flourishing condition. It would seem, therefore, that our coal trade is not dependent on the United States market. But when the time comes, as doubtless it will, when the laws of nature prevail, when they are not overridden by fiscal restrictions, and the trade is allowed to flow in its proper channels, it will be found that the opening of American markets to provincial productions will not only greatly extend our industries, but will add to the comfort and convenience of the large classes in the neighboring country to whom cheap fuel, cheap light, and cheap mechanical power are blessings."

Mayor Mackintosh warmly seconded the welcome. President Bayles, on behalf of the Institute, gracefully responded and referred to the interest the American engineers and capitalists have in Nova Scotia's great mineral resources, more especially in its magnificent coal and iron deposits, from which, he intimated, closer commercial relations may enable us to draw supplies of fuel and ore for our Eastern works.

"When we consider how much cheap coke is needed in New England and the Middle States, and what possibilities of cheap iron and steel production they suggest, even a consistent advocate of high protective duties might be so far forgetful of his principles as to wonder whether the free importation of Nova Scotia coke might not be advantageous. My friends of the Institute will excuse me if I refrain from venturing any views of my own on this point; but if cheap coke from here, suitable for use as metallurgical fuel, and bearing only the charges of shipment in bulk by water, could meet on equal terms the cheap carbonates and magnetites of the Hudson and Champlain valleys, almost any one of us would willingly contract to make pig-iron at any eligible point between Sandy Hook and Troy at as low a cost per ton as it can be delivered there from any competing center of production—domestic or foreign, near or remote."

President Bayles, in his opening address, discussed, in a calm, judicial manner, the relations of the engineer to labor, calling attention to the danger of the socialistic tendency of the times, and the necessity for guiding the movement into safe channels.

We have room for but a few extracts from President Bayles's address:

"However blind one may be to the spread and influence of socialistic teachings, there is little excuse for persistence in cherishing the idea that the wage-earner has no cause for dissatisfaction with the present unequal and inequitable distribution of the products of industry. More general education, a free press, and organization for resistance or aggression, have been the agencies by which the working classes have gained clearer ideas of their power and opportunities. The dull despair of mediæval servitude has given place to an intelligent and profound discontent with a situation which every year seems to make more hopeless; and I do not hesitate to venture the opinion that, unless strong and willing hands are extended to lift them up, they will again and again reach from the mire to pull down and destroy that to which they can not attain unaided."

"The wage-earner's future, in all but exceptional instances, promises nothing better than continuance in the labor he has learned, as a competitor with machinery which may at any time displace him and force him to seek some other and perhaps less congenial employment, or starve."

"The hopelessness of the position of the average wage-earner consists in his ignorance. The progress of the arts has been so rapid that few men starting in life without education are able to keep pace with them, or, indeed, to acquire such familiarity with principles that they can hope to attain to responsible positions of management. While the sphere of those born to serve has been thus steadily narrowing, the sphere of those so fortunately situated that they have been able to acquire liberal education is steadily broadening. The capitalist is rarely safe in intrusting his interests in mining or manufacturing to the merely practical man. Success in business enterprises of every kind now depends upon so many things of which the merely practical man knows little or nothing that management is usually intrusted to the man who combines education and experience, and his staff of responsible assistants is made up of young men of education who take subordinate positions to gain experience."

"But for industry and thrift, there should be something better than our present industrial system gives. Arbitration should decide fairly and impartially the issues between workman and employer, and some part of the profits of production should seek investment in ways which will react favorably upon the interests of labor. Participation should be established on an equitable basis as the reward of faithful service, and co-operation should be promoted wherever and whenever it can benefit the wage-earners."

The remainder of the Wednesday session and the sessions of Thursday were occupied in the reading and discussion of papers. The following papers were read mostly by title:

The Nova Scotia Gold Mines, by E. Gilpin, Inspector of Mines, Nova Scotia. Studies in the Apatite Region of Canada, by Dr. T. Sterry Hunt, Montreal, Canada. The Pictou Coal-Field, by H. S. Poole, Stellarton, Nova Scotia. Our Glacial Problem, by Rev. D. Honeyman, Halifax, Nova Scotia. Steel Castings, by A. V. Abbott, New York City. Topographical Models and their Uses, by A. E. Lehman, Philadelphia, Pa. An Electrical Furnace for Reducing Refractory Ores, by Dr. T. Sterry Hunt, Montreal, Canada. A New Method for the Determination of Phosphorus in Iron and Steel, by J. B. Mackintosh, New York City. The Specific Gravity of Low-Carbon Steels, by G. S. Miller, Benwood, West Va. The Manufacture of Iron in Canada, by J. H. Bartlett, Montreal, Canada. The Coal-Fields of Cumberland County, Nova Scotia, by R. G. Leckie, Springhill, Nova Scotia. The Homogeneity of Open-Hearth Steel, by H. H. Campbell, Steelton, Pa. Improvements in Ore-Crushing Machinery, by S. R. Krom, New York City. Note on a Self-Dumping Water-Tank, by W. Ide Pierce, Tangier, Nova Scotia. The Estimation of Manganese, Carbon, and Phosphorus in Iron and Steel, by Prof. Bryan W. Cheever, Ann Arbor, Mich. E. D. Campbell's Colorimetric Process for Estimating Phosphorus in Iron and Steel, by Prof. Bryan W. Cheever, Ann Arbor, Mich. The Oil Regions of Pennsylvania and New York, by C. A. Ashburner, Philadelphia, Pa. The Contraction of Iron under Sudden Cooling, by H. M. Howe, Boston, Mass. The Philosophy of Fire-Brick Hot-Blast Stoves, by Frederick W. Gordon, Philadelphia, Pa. The Wolf Benzine-Burning Safety-Lamp, by E. J. Schmitz, Columbia, S. C. The Cape Breton Coal-Field, by W. Routledge, Sydney, Cape Breton. The Amalgamation of Gold Ores and the Loss of Gold in Chloridizing-Roasting, by C. A. Stetefeldt, New York City. Lixiviation and Amalgamation Tests, by F. W. Clarke, Boston, Mass. The Geology of Natural Gas, by C. A. Ashburner, Philadelphia. Notes on the Treatment of Gold Ores, by William Bruckner, Marysville, Mont. Basic Bessemer Materials, by Prof. T. Egleston, New York City. The Blast-Furnaces of the North Chicago Rolling-Mill Company, by Frederick W. Gordon, Philadelphia, Pa.

Several of these papers will be published in our columns in future issues. At present, we give an abstract of Dr. Hunt's paper on the Apatite of Canada.

## THE APATITE OF CANADA.

Dr. T. Sterry Hunt, in presenting a verbal abstract of his paper, entitled Studies of the Apatite Deposits of Canada, alluded to his published

communication on the Canadian apatite deposits, made to the Institute in February, 1884, and proceeded to describe some of the later results of mining this mineral in the Lièvre District, to the north of the Ottawa River, where the mines are as yet confined to a small area in the townships of Buckingham, Portland, Templeton, and Derry; the earlier workings having been along the Rideau Canal, to the south of the Ottawa. The large mining operations lately undertaken in the Lièvre District show that the crystalline phosphate of lime or apatite belongs to lodes of great size, which traverse the ancient gneiss of the region. These lodes include a granitoid feldspathic rock, and a pyroxene rock, with large masses of quartz, of carbonate of lime, of pyrites, and of apatite. All of these often show a banded structure not unlike that of the gneiss to which they are evidently posterior, and of which they often contain fragments. Their study is full of interest to the geologist.

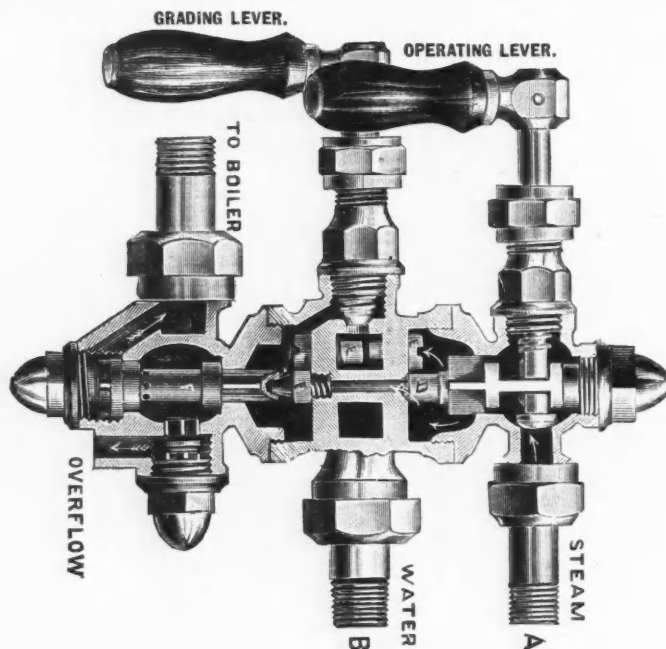
The mining operations on these great lodes, often over one hundred feet in breadth, are in part by open cuts and in part by shafts, and have reached depths of a little over 200 feet. The production of some three or four of these mines in 1883 was from 4000 to 5000 tons each of commercial apatite. The improved machinery and the better system now in course of introduction here are greatly increasing the yield of these mines, some of which during the past summer have put out 600, 700, and even 1000 tons in a month. The mineral, yielding on an average eighty per cent of phosphate of lime, is now worth in Montreal eighteen dollars a ton, and is mined with great profit. It is now chiefly shipped to Great Britain, where it is used for the manufacture of high-grade superphosphates, but it is believed that in the near future a larger market will be

#### THE STANDARD INJECTOR.

The principles on which the injector works and its application for boiler feeding have been so often described in these pages and are so well known as to call for no special remark now, but the accompanying illustration shows a form of injector that presents some features of novelty. It is a simple graded machine, and adjusts itself to varying steam and water pressures. The method of operating this injector is as follows:

*E E* are the lifting-tubes, and by giving the operating handle less than a quarter turn, enough steam is admitted to enable these tubes to raise the water, which passes down through by way of the side check-valve *C*, and discharges at the overflow. Then by giving the operating handle its full turn, more steam is admitted and the force-valve *D* is lifted off its seat by a cam on the operating valve-stem, thus admitting steam to the force-tubes *F F*, which take up the now overflowing water, and by forcing it down through the lower force-tube *F*, close the overflow, and the water is then delivered to the boiler at the full capacity of the injector.

To grade or reduce the capacity of the machine, open the grading handle from one eighth to a full turn, according to the height the water is lifted, as a one eighth turn on a twenty-foot lift reduces as much as a full turn on a five-foot lift. It is readily seen by a glance at the above sectional cut, that, by opening the grading valve, communication is had between the lifting-tubes and the already lifted water that now surrounds the force-tubes *F F*, allowing the lifting-tubes to take back, as it were, a part of



THE STANDARD INJECTOR.

found for the apatite in the United States and Canada. The growing demand for high fertilizers on this continent, and the fact that the apatite of Canada may be shipped to the valleys of the Ohio and Mississippi much cheaper than the phosphate rock of South Carolina, give a great importance to these Canadian mines. The output from those of the Lièvre District this year will probably exceed 30,000 tons. Works on a large scale are now in construction at the lower falls of the Lièvre on the line of the Canadian Pacific Railroad, for the grinding of phosphates and the manufacture of fertilizers.

While the production of the Lièvre mines has caused the neglect of the earlier discovered deposits of the Rideau District, there are among these some which, in the speaker's opinion, will be found, when properly developed, not inferior to those of the Lièvre, and he believes that these two districts of phosphate-bearing veins in Canada will soon become an important source of revenue to the country, and a great benefit to the agriculture of the continent.

Last week, we published Dr. Hunt's interesting paper on the Cowles electric smelting process, and we have already published (August 15th and August 22d) a notice of Mr. C. A. Stetefeldt's paper on Gold Volatilization. Other papers will follow.

#### THE MONTAGU GOLD MINES.

The engineers visited the Albion gold mine at Montagu, and saw one of the most remarkable collections of gold ore ever seen in America. The samples of quartz were so filled with strings of gold that the pieces of rock were held together by the precious metal, and the telegraph has since brought us the following report:

The largest bar of gold ever seen in Nova Scotia was brought to Halifax from the New Albion mines, at Montagu, September 22d. It weighed 1054½ ounces, being the product of fourteen days' crushing in a twelve-stamp mill, and is valued at \$20,618.

On Friday, the party divided, one portion going to the Windsor plaster quarries; another party to the Pictou coal-field and the Cape Breton coal-field; and a third to the magnificent iron ore deposits of Londonderry and the no less magnificent coal mines of Springhill. Each of these calls for a special report, which we shall give next week.

**New South Wales Copper.**—Considerably over a quarter of a million copper cakes and ingots were exported from the colony for the first five months of 1885.

the lifted water, and thus, as the grading valve is opened or closed, the capacity of the machine can be graded to fully one third.

The grading handle must be closed until after the injector has lifted the water and discharges at overflow.

This useful injector is manufactured by Schneider & Trenkamp, of Cleveland, Ohio, and is sold by J. A. Crouthers, No. 12 Cortlandt street, New York.

**Shot Firing Prohibited in Prussian Government Mines.**—The *Colliery Guardian* says that the Prussian government has prohibited the use of shot firing altogether in the mines that it controls where safety-lamps are used. This step has been taken since the issuing of the Fire-Damp Commissioners' report, of which it is doubtless the consequence. The observations and recommendations of the commissioners are to the following effect: "In all colliery workings where fire-damp exists, the use of black powder and all other slow explosives ought to be prohibited. Dynamite and kindred detonating substances may in certain circumstances be used; but even with these explosives, shot firing ought not to be permitted in workings where accumulations of fire-damp are possible in sufficient quantity to give a clearly perceptible blue cap on the lamp. In all cases, it is desirable that the air should be tested within a radius of ten yards before igniting any shot."

**Liquid Fuel.**—The utilization as fuel of the tar, creosote, and other by-products of gas making and coking is receiving much attention in Europe, where many working tests have recently been made. Colonel Sadler, of Sadler & Co.'s Chemical Works, Middlesborough, has patented an invention for burning these products in steam-boilers, and tests made on the steamship Emmanuel, which used creosote fuel in a recent voyage from Middlesborough to Caen, France, and return, were highly successful. The master, Captain Harforth, and the engineers, reported that, though they had encountered very rough weather, the vessel behaved well, and the new fuel and appliance had proved most successful. They were quite satisfied that it was superior to coal in regard to economy and cleanliness, there being no smoke. Perhaps the greatest advantage in the utilization of liquid fuel on shipboard is the saving of room, as the space at present occupied with bunker coal can be used for cargo, the oil being stowed away in the water-ballast tanks. Its utilization will also effect a saving in the employment of stokers, and two stokers, it is stated, will be sufficient for even the largest steamer to carry, one stoker for each watch.



THE CLAYTON COMBINED SPEED AND PRESSURE GOVERNOR.

The new air-compressor governor, of which we give perspective and sectional illustrations, is one of Mr. James Clayton's latest patented improvements on air-compressing machinery, by means of which he has brought the Clayton air-compressors to their present state of perfection and enabled them to work with exceptional economy.

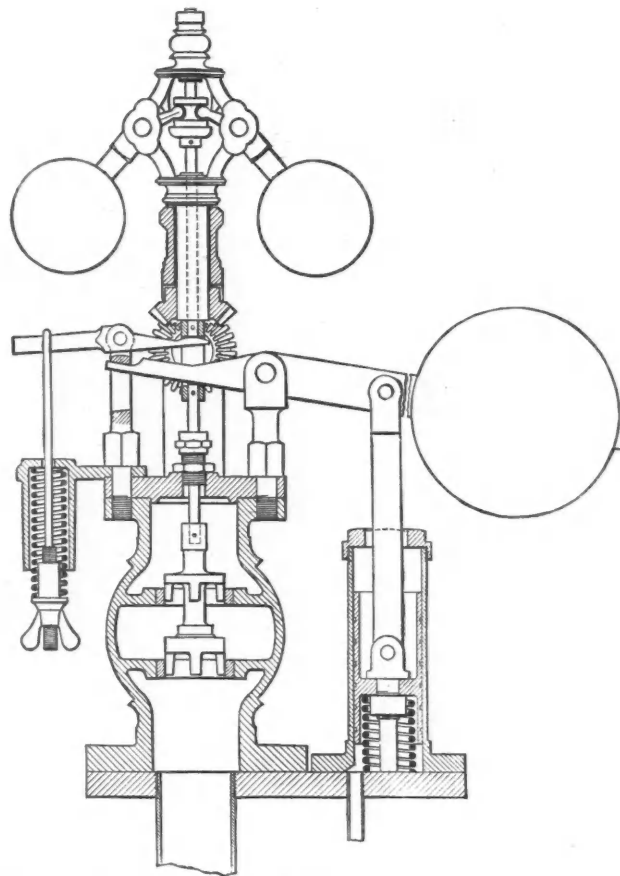
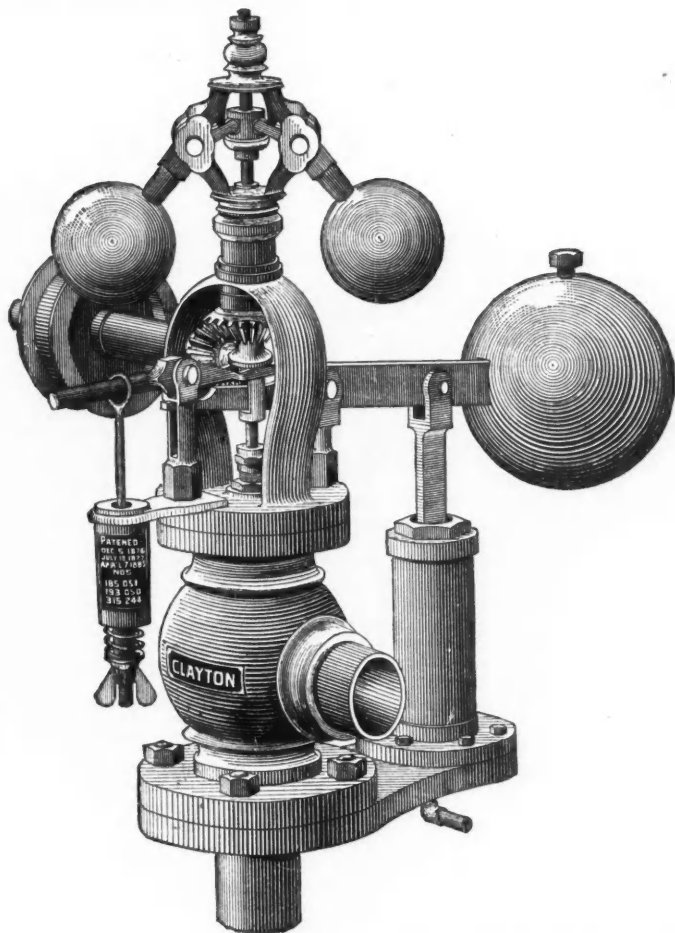
The patent air-pressure governor that the Clayton Air-Compressor Works has been using for some time, and for which it has sole license, is a perfect working governor for pressure wherever the air-compressor is of sufficient capacity always to keep the pressure at its maximum; but in many cases, through false economy, compressors are selected that are too small to do their work, and in such cases the air pressure will be frequently and suddenly reduced, say from 80 pounds to 40 pounds per square inch, and with only half the resistance, causing the compressor to work dangerously fast. A sudden reduction of pressure occasioned by the bursting of hose or breakage of pipes may cause a like result, and it is then that the speed governor comes into use, turning off the excess of steam pressure, so that the compressor shall not run in excess of the proper maximum speed. Each governor does its own work, one to check the admission of steam when the pressure is at its

silver bullion, as expressed in gold dollars, in the open market in New York city during the preceding month, which price so determined shall be the value or ratio to gold at which the certificates shall be issued during the succeeding month.

Or the market value may be determined for each day, as follows:

The value or ratio to gold at which certificates shall be issued on silver bullion deposited under this act shall be its actual ratio or market value at the time of deposit, to be determined by the Secretary of the Treasury for each day by taking the mean selling price of silver bullion in the open market in New York City in gold dollars on the first preceding day on which actual sales were made, or substitute London for New York and deduct from the London price the cost of transporting silver bullion between New York and London.

The price at which silver bullion shall be delivered in the redemption of certificates shall be the price at which at the same time it is being received, provided that certificates shall not be issued on silver bullion at a value above the ratio of silver to gold as now fixed by law for standard gold and silver coins; and if at any time silver bullion rises to a value equal to the ratio of the two metals in existing standard coins, then any holder of silver bullion may, at his option, receive certificates for it as provided in this act, or have the same coined at that ratio into



THE CLAYTON COMBINED SPEED AND PRESSURE GOVERNOR.

maximum, and the other to check the steam when the speed is at its maximum; neither governor interferes with the other under any circumstances, yet each does its own work with positive certainty without any attention on the part of the engineer, thus removing much danger of breaking or injuring the machine, and, by always having the full and even pressure of air, much more work can be done.

THE PROPOSED WARNER SILVER BILL.

A bill to provide for the issue of treasury certificates on deposited silver bullion, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, That any holder of silver bullion may deposit the same with the Treasurer or any assistant treasurer of the United States in amounts not less in value than \$10, and receive therefor certificates in denominations of \$10 and multiples of ten, prepared as now provided by law for United States notes. Such certificates shall be receivable at par in all parts of the United States for customs, taxes, and all other public dues, and may be deposited by national banks for the redemption of the circulating notes, and shall be a legal tender between national banks, and shall also be a legal tender in payment of all debts and demands owing by the United States, except where payment in coin is expressly stipulated. They shall be redeemable on presentation at the Treasury or Sub-Treasury in the city of New York in lawful money, or, at the option of the Secretary of the Treasury, in silver bullion at its market value at the time of redemption.

SEC. 2. The value or ratio to gold at which certificates shall be issued on silver bullion deposited under this act shall be its actual ratio or market value at the time of deposit, to be determined by the Secretary of the Treasury for each calendar month by taking the average selling price of

standard dollars or half-dollars of the weight hereinafter provided, on the same terms and conditions as provided by law for the coinage of gold; but if hereafter the ratio of silver to gold in standard coins shall, by law or international agreement, be changed, then this provision shall be made to conform to such new ratio.

SEC. 3. The silver bullion deposited under this act shall be received subject to all the provisions of law as to assaying, melting, and refining, when below standard, casting into ingots or bars, the same as if deposited for coinage; provided, that coins struck at European mints and ingots and bars made by melting down such coins shall be excluded from the provisions of this act.

SEC. 4. When any of the certificates herein authorized are redeemed in silver bullion, they shall be canceled and destroyed; but certificates which come back into the Treasury by being received for customs, taxes, or public dues or in exchange for lawful money shall not be canceled, but shall be held as cash, and may be reissued or paid out again as current money for all debts and demands owing by the United States, except where payment in coin is expressly stipulated.

SEC. 5. That on the taking effect of this act, the monthly coinage of silver dollars under the act of February 28th, 1878, shall be stopped, and in lieu of such monthly coinage the Secretary of the Treasury is hereby authorized and required to cause the coinage, from time to time, of standard silver dollars from bullion deposited under this act, in amounts sufficient to supply any demand that may arise for coined dollars for circulation or that may be required to pay the coin obligations of the government; provided that, concurrently with the coinage of any silver bullion for which certificates have been issued under this act, the Secretary of the Treasury shall cause to be destroyed certificates equal in value to the bullion so coined at the time of its deposit.

SEC. 6. There shall be no further issue or reissue of five dollar national bank notes, nor of one and two dollar United States notes; but notes of

larger denominations may be issued in place of the five dollar national bank notes retired, and the total amount of United States notes, as now fixed by law, shall be kept up by substituting notes of a higher denomination for one and two dollar notes.

SEC. 7. In addition to the denominations of silver certificates provided for by the act of February 28th, 1878, there shall be issued, in like manner, upon the deposit of silver dollars, certificates of denominations of one dollar, two dollars, and five dollars, which certificates shall be similar in form and shall possess the same money functions as those of higher denominations issued under said act.

SEC. 8. Certificates issued on the deposit of coined silver shall be known as silver coin certificates, and certificates issued under this act, on the deposit of silver bullion, shall be known as silver bullion certificates.

SEC. 9. After the passage of this act, it shall be unlawful to issue Treasury certificates on deposited United States notes.

SEC. 10. That all half-dollar pieces struck since 1853, now in the Treasury, or hereafter received in the Treasury, shall be melted down and recoined into half-dollars, weighing 206½ grains each, and such recoined half-dollars, together with half-dollars struck before 1853, shall be legal tender in all payments the same as standard dollars.

SEC. 11. That the act approved June 9th, 1879, providing for the redemption of subsidiary or fractional coins, is hereby repealed.

SEC. 12. That until January 1st, 1888, the coins known as trade-dollars shall be receivable at their face value for all dues to the government, and exchangeable, when presented at the Treasury or Sub-Treasury in New York, or at any of the mints, for standard dollars. The trade-dollars so received shall be melted down and coined into standard dollars or half-dollars of the weight provided for in this act, as the Secretary of the Treasury may direct.

SEC. 13. That there is hereby appropriated out of any money in the Treasury not otherwise appropriated sufficient money to pay the expense of certificates to be issued under this act, and the coinage and recoinage of half-dollars and standard dollars provided for in this act. And this appropriation shall stand as a permanent appropriation.

SEC. 14. This act shall take effect —, 1886.

#### NORTH CAROLINA MINING NOTES.

Written for the Engineering and Mining Journal by Arthur Winslow, Engineer and Geologist.

Mica mining promises to be prosecuted with increased activity during the coming season. While recently on a trip to Mitchell County, a few of the mines in that important mica section were visited. The mica occurs there as a constituent of veins that traverse a highly feldspathic granite. The veins themselves may be regarded as granite dikes, of extremely coarse composition, made up of ill-defined mammoth crystals of mica, feldspar, and quartz. The distribution of the mica in the veins is irregular, but at those localities visited the larger crystals seemed to be in the central portion of the vein. A distinction of importance to the miner is made between what are called "fluken veins" and "rock veins." The former are veins that have suffered from the disintegrating effects of weathering, and the rock is comparable to the "brown ores" of the gold miner. The feldspar has been so decomposed in these veins that they can be easily worked with a pick, and the mica, which has remained almost intact, is extracted without much expense. It is to these veins that the work of the mound-builders, with their crude appliances, was confined. Such veins are limited in extent downward, and pass by degrees into rock veins, which latter are very hard and difficult to work. The mica is generally taken out in blocks an inch or two thick and a foot or so in diameter. The color of the sheets, when split, is white, a pale green, or a rum color. They are frequently spotted and blurred with stains of manganese or iron, and this very much lowers the market value. The white mica is always valuable, and the rum-colored is much sought after.

The mines are often worked by the owners of the land or by companies. Leases on mica properties are generally given for one sixth of the product with fluken veins, and for one seventh with rock veins. The preparation of the mica for market is a very simple process, consisting in splitting the mica into sheets of about one sixteenth of an inch in thickness, and in cutting these, according to patterns, into squares with a pair of ordinary tinner's shears. One man can split and cut many pounds in a day. The squares range in size from 3 by 4 inches upward. And the prices vary, according to size and color, from \$1 to \$5 and more a pound. The mining of this product is in many cases very crude, and is carried on on a small scale. Yet, with a good, average vein, the profits are large. The difficulty, of course, lies in securing a good vein. As with all veins, the material varies in composition, and the rich finds are generally in pockets that often contain within a few cubic yards of vein rock several hundred dollars' worth of mica.

In your issue of September 12th, you notice a late report of the New Hoover Hill Gold Mining Company. I had occasion to visit this mine during the early part of the month. The production for August much exceeded that for July, and was greater than that for any preceding month. Over 700 tons of the ore were milled, which yielded over 500 ounces of bullion. About 100 men are employed here. The mine is opened by several shafts, the principal one being 300 feet deep. The mining and milling plants are good, and are well arranged. The ore is hoisted by two 30 horse-power engines, with 4-foot drums, and the mine is drained by a 50 horse-power Cornish pump. The ore from the mine is first picked by hand at the platform adjoining the shaft, and is then run in cars by gravity to the mill, about a quarter of a mile distant. It is there dumped, at the top of the building, into chutes, which convey it to the Blake crushers, whence it passes to the stamps. Twenty Beckett & McDowell stamps, with amalgamating plates and blankets, are used, as well as a Beckett & McDowell pan and two settlers. The ore is a peculiar one, consisting of a siliceous slate traversed by veins and threads of quartz, rarely exceeding a few inches in thickness. The slate itself is generally barren, and ore containing no quartz veins is thrown aside at the platform. The quartz veins run irregularly through the rock, and often die out within short distances. No true vein is therefore worked,

but quartz-bearing portions of the slate are followed and mined as long as they are paying. The gold occurs in the ore in the free state in fine grains and as dust generally distributed in the quartz veins along the plane of contact, between the quartz and the slate. Only about one per cent of sulphides is associated with the gold, so that it is practically entirely free milling, although, as the rock is exceedingly hard, it is by no means an easily worked one.

This is one of the largest yielding mines in the State, and it is to be hoped that its increased prosperity will continue, and that a return may be insured to the purchasers for the large sum that they were led into paying for the property.

RALEIGH, N. C., Sept. 19.

#### MODERN AMERICAN METHODS OF COPPER SMELTING.\*

By Edward D. Peters, Jr., M.E., M.D.

##### CHAPTER IX.

##### THE SMELTING OF COPPER.

By this term, we understand the fusion of the copper-bearing material and of whatever fluxes may be necessary, when the copper, owing to its higher specific gravity, separates from the slag, and is recovered by appropriate means. In the case of oxidized ores, it is obtained at once in a metallic condition, somewhat adulterated with sulphur, iron, and other foreign substances, but requiring only a single operation, or, at the outside, two more operations, to bring it into merchantable form.

But when it occurs in combination with sulphur or arsenic, and accompanied with an excess of foreign sulphides, the result of the first fusion is merely a concentrated ore, freed from the earthy gangue, and resulting from a combination of the copper with sufficient of the sulphur present to form a subsulphide, to which is added as much monosulphide of iron as corresponds to the remaining sulphur, always excepting such portion of that metalloid as is volatilized during the process of fusion. If tin, zinc, lead, silver, antimony, or arsenic are present, they combine with the sulphur for the most part and enter the matte, their affinity for sulphur being in the order mentioned, according to Fournet's experiments.

These various sulphides unite either physically or chemically to form the substance technically known as *matte*, or *metal*, or *regulus*, the latter term not to be confounded with the term *regule*, which belongs to a matte of a certain richness in copper, and possessing peculiar and well-marked characteristics.

From the above statements, it is plain that, other things being equal, the grade of the matte depends on the amount of sulphur in the ore.

It might, at first glance, seem more economical to push the roasting process to the extent of removing all the sulphur, thus bringing about the same conditions that prevail in the smelting of an oxidized ore; but practice has shown the futility of such a scheme, as, aside from the great expense and difficulty of effecting such a complete calcination, the resulting slags are always too rich in copper; the smelting process suffers for want of oxidized iron to neutralize the silica, and the copper when produced can not compare in quality with the metal resulting from the ordinary methods of treatment, where the numerous alternate oxidizing and reducing influences remove, for the greater part, those traces of impurities that are almost invariably present, even in the purest ores, and which have such a powerful effect on the physical condition of the finished metal.

Copper smelting, therefore, is naturally separated into two great divisions, according to the composition of the material to be treated: 1. Smelting of ores containing sulphur (arsenic, antimony). 2. Smelting of ores free from sulphur (etc.). But each of these classes may be again divided, according to the apparatus employed, into—

A. Smelting in blast-furnaces.

B. Smelting in reverberatory furnaces.

But few exact statements by practical metallurgists of comparative results are obtained by running the two classes of furnaces side by side on the same ore, and under the same management and conditions. The fact that, during the author's career as manager of various copper-works, he had smelted about an equal amount of ore in each class of furnace, and in several instances carried out quite extensive comparative tests at the same works as to cost, capacity, etc., may lend value to such statements.

Considerable animosity has been evinced by the partisans of the reverberatory and of the blast-furnace system of treatment—or Swansea and German methods, as they are often termed. Much of this arises from a want of exact knowledge and appreciation of the advantages and peculiarities of the opposing system.

Since blast-furnace smelting has obtained a footing in the United States, it has become so changed from its original as to be scarcely recognizable, and as here used, by the more advanced metallurgists, can challenge competition with the reverberatory under most circumstances, and, where the conditions are at all favorable, can show results far surpassing the best Swansea work in yield, economy, and capacity.

That this may seem novel or even doubtful to English smelters, is quite natural, when it is recollected that the full extent of these remarkable advances is known to comparatively few metallurgists, and that very little relating to the same has been published.

It is with the modern American form of the German copper process that all comparisons must be instituted; and this comprises not only a great improvement in the processes of calcination and the construction and management of the blast-furnaces used, but, in many cases, the employment of reverberatories for certain portions of the matte concentration, while the process of refining is in all cases carried on according to the Swansea method.

In any attempt at a comparison of these two great methods of smelting, one is confronted by the inextricable mingling of the commercial with the metallurgical that is so characteristic of the English system. Without a thorough understanding of the peculiar local conditions under which the ores are purchased at the Swansea ticketings, it is impossible fully to appreciate the fine points of the complex and ingenious

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system that time and circumstances have elaborated, or to realize the important influence exercised, on the whole subsequent series of operations by the amount of judgment displayed in the purchase of the ores, and in the adaptation of the same to the immediate needs of the works.\* The Swansea smelter receives his ore in numberless small parcels, differing not only in richness, but in purity and other qualities. To carry out the reverberatory process to the best advantage, he requires, in addition to the main supply of sulphide ores, a certain proportion of oxides and carbonates, all of which are obtainable in the public ore market. His coal is of the cheapest and most suitable quality, and the refractory material—fire-brick, clay, siliceous sand, etc.—is obtainable at prices far below American rates. He also has at his command a body of experienced and skillful workmen who have grown up at the furnaces, and who, at very low wages, are fully capable of executing all the difficult operations demanded by this system of treatment. In addition, he has a market for his product, where every variety of metal brings the highest justifiable price.

(TO BE CONTINUED.)

COMMERCIAL ELECTROLYSIS.†

By Paget Higgs, LL.D., D.Sc.

ARRANGEMENT OF BATHS.

Besides the rate of deposit, or thickness of copper obtainable in a given time, attention is required to consider the best arrangement of baths. At one time, it was earnestly promulgated among electro-metallurgists that copper would be best deposited with an insoluble anode, from a moderately pure solution. However much easier it might be to obtain solutions of greater purity than a commercial soluble anode, there are simple and ample reasons why soluble anodes should have been adopted, and these have been very clearly stated by M. Gramme practically, and by M. Ed. Becquerel from experiment. The experiments of the latter are twenty years old, but the results are little known and still hold good. They are given in his *Éléments d'Electro-Chimie*. It is to be seen that the processes of electrolysis are, as regards economy, much elucidated by these experiments. Becquerel found that, with a saturated solution of sulphate of copper, to which one twentieth of sulphuric acid is added, the loss of weight at the positive electrode, when of copper, is always greater than the increase of weight at the cathode. This difference varies from 2 to 5 per cent of the weight of the deposit. That with a cold neutral solution of sulphate of copper, neutralized by the addition of carbonate, the loss at the positive pole was both greater and less, in several experiments, than the increase at the negative pole, but the differences were not 1 per cent. As a mean, the loss of weight was less than the weight of metal deposited, a result that seems anomalous, but one to which reference will be made subsequently. It will, perhaps, be found chiefly due to the solution of the anode by the free acid of the bath.

In practice, or rather in that properly directed and intelligent practice where measurements of current quantity and electro-motive force are taken during the deposition of copper on the large scale, there is found frequently much more current circulating in the baths than is due to the machine, when the same power is expended upon it in driving a current on an equivalent resistance. Theoretically, there should be less; that is, the usual theory would indicate that there should be less. The writer has been in his novitiate days much puzzled by this phenomenon, which became the better demonstrated the more careful the measurements, until he found it to be due to excessive acidity of the solution as well as sometimes to impurities in the plates. The purer the sulphate from which the solution is obtained, the smaller does the difference become between the true machine current and the current actually circulating. A loss of work actually occurs from this cause; there is no gain from the false current; the loss will be as much as from 3 to 4 per cent of the work expended. The remedy is found in the use of as pure solutions as possible; but these solutions must not be too concentrated; for when they are too rich in copper, the purity of the deposited metal is affected, and as well the mechanical texture of the deposit.

Even in pure solutions of sulphate of copper with pure copper electrodes, currents are sometimes set up the electro-motive force of which may be in either direction accordingly as either plate may be in a solution of greater or less density than the other. In general, the electro-motive force due to this cause in the depositing-bath is of contrary direction to the working current, because the solution is usually less dense near the cathode, where metal is given up, than near the anode, where the bath is receiving metal into solution. That the direction of electro-motive force due to this cause may, however, be that of the working current, is easy to be seen.

Baths of copper solution at rest as regards the depositing current are, when large, by no means at rest as regards freedom from inherent chemical actions. It is a very long time before the electrodes become neutral to each other, and even then local actions are of constant occurrence. For instance, in wooden vats M. Becquerel has observed on the wood, after some time, large adhesions of copper. The organic matter has probably started the reduction. Then the particles of copper so reduced have formed, with the carbonaceous matter of the wood, a small voltaic couple, depositing copper on the copper already put down.

Lead-lined vats are practically great nuisances. If by ill chances—and these are numerous—the metal comes into contact with either electrode, there is trouble; and if a strongly acid solution be left in a lead vat, the first set of cathodes deposited from that solution will very probably contain impurities, not necessarily lead, but other impurities that have become absorbed in the bath through electric action in which the lead has played its part, and previously to be found in the bottom-mud.

The use of insoluble anodes involves the finding of an insoluble material that shall be conducting and also, which is unknown, of the same electrical affinity, so as to give, when placed opposite to a copper cathode, no difference of potential. Otherwise, work must be done in

overcoming the contrary electro-motive force set up; for if the anode be less negative than copper, then the copper would be deposited upon it and not at the cathode. The use of insoluble anodes does not, however, occur in practice, and its want of economy has been clearly demonstrated by Gramme in his report to the Academy of Sciences in Paris.

The most economical arrangement of the series of baths is, however, a problem that can not be so easily dismissed, and we can refer advantageously again to Gramme's experiments. These were made with a variable number of baths, placed parallel or in "shunt" one with another—that is to say, in the manner formerly adopted. With from one to thirty-six baths, the deposit was the same, not per bath, but per varying number of baths. Thus, with a single bath, the current being maintained constant, 7 grams an hour were deposited; with a dozen baths, 7.1 grams; and with thirty-six baths, it was still 7.1 grams, or about 2 decigrams per bath. Faraday's law was in this commercial manner proved. Next, the same baths were arranged in chain, the currents being again maintained constant by increasing the speed of the machine and the electro-motive force from 1 to 8 volts; then the deposits of copper increased with the number of baths. It increased not only in absolute quantity, but with regard to the work expended in the operation. The weight of copper deposited per kilogramme of work expended varied from 1.58 to 23.18 grams, whereas, in the former series of experiments, it was never above 1.96 grams. The conclusion is clear—there is enormous economy in arranging the baths in chain, or in tension, as the term goes.

In another series of trials, M. Gramme maintained a constant current, but increased the size of the electrodes when he added to the number of the baths, so as to maintain also constant the total resistance of the circuit. The quantity of copper deposited in each bath was sensibly the same. The speed of the machine and the electro-motive force of the current were not changed, and the work expended was therefore constant. The trials were made in perfect accord with all received theories, except in one particular, in which M. Gramme was led to increase the liquid section more than he increased the number of baths in chain. But it is somewhat astonishing to see, as M. Fontaine has remarked, that in each separate part of the circuit the quantity of copper deposited remains nearly constant; and as the total quantity of copper deposited in the whole circuit is proportional to the number of baths, it must be concluded, however startling the conclusion, that, with a fixed quantity of work expended, it is possible, by proper arrangements, to increase nearly indefinitely the total deposit. In support of this statement, it will be better to reproduce here the figures obtained by Gramme, noting that the surfaces of the baths were so increased as to obtain a constant deflection on the galvanometer; also that the temperature due to the current was not determined in experiments 4 and 5:

Number of trial.	Baths.				Work in kilogrammetres.				Deposit in grams.			
	Number.	Surface of each bath in sq. cm.	Galvanometer deflection.		Total.	Absorbed by friction.	Absorbed by elevation of temperature.	Difference.	Total in one hour.	Per bath.	Per kilogramme of total work.	Per kilogramme of "difference."
1	3	8.26	7.5°		3.397	1.722	0.624	1.051	15.75	5.25	4.63	15.00
2	5	16.52	.....		3.452	1.765	0.693	0.994	29.60	5.80	8.43	29.17
3	7	33.04	.....		3.520	1.837	0.969	0.714	37.38	5.34	10.62	52.35
4	9	49.56	.....		3.279	1.613	0.969	0.714	48.00	5.33	14.63	52.35
5	11	66.08	.....		3.449	1.788	0.969	0.714	61.60	5.60	17.85	52.35

(TO BE CONTINUED.)

PATENTS GRANTED BY THE UNITED STATES PATENT-OFFICE.

The following is a list of the patents relating to mining, metallurgy, and kindred subjects, issued by the United States Patent-Office.

GRANTED SEPTEMBER 15TH, 1885.

- 326,091. Friction-Clutch. Albert B. Bean, New Haven, Conn.
- 326,092. Steam-Engine Governor. Jules Begtrup, Elizabeth, New Jersey.
- 326,093. Asbestos or Amianthus Stove and Furnace Pipe. Andrew R. Bennett, Utica New York.
- 326,121. Roll for Roller-Mills. James W. Jackson, Denver, Colo.
- 326,129. Coal-Elevator. Walter Lawton, Winthrop, Mass.
- 326,147. Apparatus for Casting Steel and other Metal Bars, Rods, etc. Carl M. Pielsticker, London, County of Middlesex, England, and Friedrich C. G. Mueller, Brandenburg-on-the-Havel, Prussia, Germany.
- 326,149. Evaporating-Pan. John F. Porter, Red Wing, Minn.
- 326,161. Furnace for the Combustion of Liquid Fuel. Jasper H. Selwyn, Gloucester Crescent, Hyde Park, County of Middlesex, England.
- 326,176. Dust-Collector. Pieter Van Gelder, Sowerby Bridge, County of York, England.
- 326,181. Means for Filling Furnaces. Peter L. Weimer and Henry T. Euston, Lebanon, Pa.
- 326,182. Blast-Furnace. Peter L. Weimer and Henry T. Euston, Lebanon, Pa.
- 326,183. Sheet-Metal Cutting Press. William Werts, Camden, New Jersey.
- 326,196. Mechanism for Operating Valves. James H. Blessing, Albany, New York.
- 326,201. Pump. John P. Cobb, College City, Cal.
- 326,232. Steam and Air-Injector for Furnaces. William Matthews, St. Clair, Assignor of one half to Frank A. Hill, Philadelphia, Pa.
- 326,239. Miner's Squib. John R. Powell, Plymouth, Pa.
- 326,266. Automatic Pump and Water-Elevator. Anthony H. Bryan, Evansville, Ind.
- 326,267. Apparatus for Raising Water. Cuthbert Burnett, Hartlepool, County of Durham, England.
- 326,295. Grate for Furnaces. Silas H. Huntington, West Pittston, Pa.
- 326,309. Furnace-Grate. Charles Martin, Paris, France.
- 326,408. Steam-Injector. John Desmond, Cleveland, Ohio, Assignor to Simon & O'Neill, same place.
- 326,409. Single-Acting Pump. William H. De Valin, San Rafael, Cal.
- 326,427. Overflow Device for Pump-Lamps. Thomas W. Hamilton, Springfield, Mass.
- 326,434. Pump. Lawrence A. Kelly, Dayton, Washington.
- 326,445. Culin-Conveyor. Ransom Y. Mitchell, Bradford, Pa.
- 326,446. Method of Transporting and Sorting Culin. Ransom Y. Mitchell, Bradford, Pa.
- 326,451. Apparatus for Utilizing Wood-Gases. Henry M. Pierce, Nashville, Tenn.
- 326,452. Process of Utilizing Wood-Gases for Metallurgical Purposes. Henry M. Pierce, Nashville, Tenn.
- 326,483. Amalgamator. Franklin L. Downend, Idaho Springs, Colo.
- 326,511. Rock-Drill. Andrew McConnell, Pittsburg, Pa., Assignor of one half to Edward W. Swentzel, same place.
- 326,516. Machine for Forming and Threading Sheet-Metal Pipes. Mortimer K. Pierce, Perryvale, Assignor of one half to Philemon Hawkins, Marysville, Cal.

\* See Percy on Copper for a full description of the Swansea ore sales, together with quality and value of ore offered.

† From the Engineer



## FURNACE, MILL, AND FACTORY.

The Sturtevant pulverizer is apparently pulverizing opposition almost as rapidly as the ore it works on. At Balbach's Smelting Works, in Newark, N. J., this machine is used to pulverize copper matte, which it does at the rate of from 4000 to 6000 pounds an hour.

A dispatch from Harrisburg, Va., says: The Shenandoah Iron Company, at Milnes, in this county, has defaulted on the payment of some of its indebtedness, and a bill was filed in the Circuit Court of the United States to-day asking for an injunction and a receiver. The parties to this action are the Seventh National Bank, the Union Trust, Safe Deposit, and Insurance Company, the Eighth National Bank, and John Milnes, all of Philadelphia. The liabilities of the company are about \$900,000, of which \$500,000 is first mortgage bonds. The remainder is floating indebtedness. The injunction and receiver are asked for by the creditors representing the floating debt.

The first Bessemer converter in the Schuylkill Valley was started on the 21st inst., by the E. & G. Brooke Iron Company, of Birdsboro'. The metal was run directly from No. 2 blast-furnace into the converter, and, after blowing, run into molds the size of ordinary nail-plate slabs, and from thence to the nail-plate rolls, without going through the ordinary process of blooming. The converter is one ton capacity, and at each blow makes fifteen nail-slab ingots. The plant was designed by J. C. Dods, of Danville, and the converter constructed by the Scott Foundry, of Reading.

The work of excavating for the new blast-furnaces to be built by the Troy Iron and Steel Company, on Breaker Island, opposite the Bessemer Steel-Works, which was begun about three weeks ago, is pushed forward as rapidly as possible. A force of about 200 men is engaged. Two steam-engines are at work continually pumping the water from the excavations. It is expected that the work of laying the foundations will begin soon. The furnaces will be three in number. The dimensions of each will be 18 by 80 feet. Captain Hunt, the general superintendent of the works, says that the company intends to begin blasting within a year.

A new trial having been granted the Bethlehem Iron Company in the suits brought against it by former employes for the recovery of moneys deducted from their wages in settlement of bills contracted at the company's store, a second trial of four of the suits regarded as test cases was had in court at Allentown, Pa., September 17th, the jury returning a verdict in favor of the company in each case. Upward of one hundred suits have been brought by the employes, and the amount involved will reach \$150,000, receipts being produced by the defendant in court to-day aggregating \$120,000.

A dispatch from Danville, Pa., says that H. S. Pierce, of Scranton, for \$29,000 this morning became the possessor of the Glendower Iron-Works of Danville. A few years ago, the works were valued at a quarter of a million. Mr. Pierce will take immediate action to put the works in better shape. Iron men here recognize a decided improvement in the trade, and a more hopeful spirit prevails in business circles. The Nail and Stove Works are running to their fullest capacity, and improvements under way will soon employ many additional hands at the former.

## LABOR AND WAGES.

The great strike that has prevailed at the Cleveland rolling-mills for the past three months practically ended September 22d. The company made the announcement that it would blow the whistle for the men to go to work the same as if no strike had ever occurred, and if the men did not return, their places would be filled. About 200 or 300 men passed through the gate into the works. A detail of police guarded the entrance, and no attempt was made to injure those who desired to work. Several who had gone to work on the 21st came out on the 22d, and refused to return. This was considered an omen of good to the strikers, but it was discovered before long that a number who had been thought firm had slipped in and gone to work. In one of the mills, there were more men ready to work than were needed, and they were told to go home, but that on the 23d they would be given places. A meeting of the strikers was held on the 22d, and it was the conclusion of the far-sighted ones that the strike was over and a substantial victory won by the rolling-

mill company. On September 24th, the company announced that it would pay the prices that the men struck for in June, and asked that all the skilled laborers return to work. The advance made in the price of wire made it possible for the company to keep a promise made to its employes last June, that, as soon as prices advanced, there would be a corresponding increase in wages.

The trouble in Wyoming Territory continues. On September 21st, a body of men, masked and armed, paid a visit during the night to the quarters of the Chinese workmen at the Black Diamond mine, and burned their houses. The Chinamen fled on their approach. They had been discharged from the mines and were preparing to go to Seattle. A convention of delegates from all parts of the Puget Sound country has been called to meet on September 28th, to devise means of ridding the region of Chinamen. At Rock Springs, work has been resumed in two of the mines where the recent troubles occurred. About 100 Chinamen and a few white men have gone to work, but the white miners as a rule have refused to go back. No attempt has been made to interfere with the Chinese workmen, the mines being guarded by troops. On Sunday night, one of the Citizens' Committee, Dowell, who presented the case of the miners to Mr. Bromley and to the government directors, was busy giving notice to all the white miners who were suspected of a disposition to resume work that they must leave the place within twenty-four hours. Notice was also given to the deputy sheriffs who were doing guard duty at the mines, that they must quit. Another member of the Citizens' Committee, Hoyt, who was most conspicuous in the management of the miners' case, has left town. The Knights of Labor in the employ of the company are free in their denunciations of the whole business, and assert their confidence that the strike will be confined to the miners. The railroad officials say that they will have no difficulty in procuring the services of white miners. The Chinese consuls are still pursuing their investigations, and will probably remain through the week.

The striking coal miners of Staib's mines, third pool, Pittsburg, resumed work September 23d at the operator's terms. This is the first break in the strike, and the action of Staib's men has caused considerable excitement among the strikers. The miners of the Pan-Handle & Chartiers Railroad met on the 22d, and passed a resolution demanding 3 cents a bushel. The meeting was largely attended. All were strongly in favor of the advance rate in mining, but there was a difference of opinion as to whether the demand would be granted.

A press dispatch from Pittsburg, dated September 22d, says that the smaller coal operators of the fourth pool are reported to have joined hands with the striking miners to defeat the heavy operators and shippers, because of a recent attempt of the latter to control the business. The price demanded by the strikers has been conceded at two mines in the fourth pool, and at several others preparations for an early resumption are making.

The Du Bois (Pa.) *Courier* of September 17th says: Never before in the history of the anthracite coal regions has the situation been so unsettled, uncertain, and precarious as at present. The miners and laborers are extremely dissatisfied, and bitterly murmuring against low wages, which hardly afford themselves and their families a bare existence, and against the alleged oppressive company store system, and the greedy and unscrupulous exactions of the mining and transportation corporations representing the so-called combination. The colliery operators, seeing nothing but starvation staring them in the face, are organizing to fight the monopolists. The Amalgamated Association of Miners and Laborers, under the leadership of George Harris, president of the organization, and John Parker, former executive head of the Miners' and Laborers' Benevolent Association, is busily engaged in the work of agitating the colliers. So rapidly have the latter enrolled themselves under the standard of the union that the membership has already reached 62,000, and every important field in the coal district is represented. Prominent Lehigh producers believe that serious and perhaps disastrous complications may eventuate in the trade.

A report comes from Bevier, Mo., that, on September 21st, an air-compressor, to be used in the coal mines of Loomis & Snively, at that place, was blown to pieces by dynamite or some other explosive. The machine

had not yet been unloaded from the car on which it had been taken to Bevier. There is no clue yet to the perpetrators of the act, but it is supposed to have been done by some of the white striking miners who formerly worked at the mines, to wreak vengeance upon Loomis & Snively, who now employ none but negro miners. The machine was valued at about \$3000.

The Enterprise Coal Company, of Mount Carmel, Pa., notified its miners that it would prepare and deliver the necessary timber, as provided by the State law, and would consider the question of advancing the rate of wages. The men returned to work on September 18th.

## COAL TRADE NOTES.

## CANADA.

## PROVINCE OF NOVA SCOTIA.

A dispatch to the *Montreal Gazette*, dated Halifax, September 15th, says that Sir George Elliott, M.P., the great English colliery owner, is in Nova Scotia for the purpose of bringing about an amalgamation, under one powerful syndicate, of the various Pictou collieries, operated by American, English, and Montreal companies, so as to increase the capital, curtail the expenses of management, and thus more effectually compete with the Spring Hill mines, which are threatening to control the Montreal and Lower Province markets. The annual output of the proposed syndicate is 1,000,000 tons.

## ILLINOIS.

On September 17th, the Niantic coal mine was the scene of a frightful accident, which may result in the death of two men. Five miners were sent down the shaft in the cage, when the engine got beyond the control of the engineer, and the cage went to the bottom, a distance of nearly 200 feet, with great velocity, the shock stunning the men and injuring all seriously.

The Eureka Coal Company, with mines in Will and Grundy counties, in Illinois, on the 21st inst., confessed judgment of \$27,709 in favor of Eric L. Hedstrom, a Buffalo coal merchant, and Charles P. Wheeler was appointed receiver of the company. The Eureka Company is a member of the Wilmington Coal Association, and its property is valuable. It is obliged to pay its employes twice a month, and failure to pay would result in litigation and stoppage of business. The company was unable to pay off its men last week, and goes into the hands of a receiver to prevent the deterioration or destruction of its property. The business will go on as usual.

## MARYLAND.

Forty cents a ton for run of mine coal is paid at Westernport for mining both the big vein and the upper vein. The Franklin mine is the only company in the region that has opened into and is operating the upper vein, which averages from 5½ to 6½ feet in thickness. The Phoenix mine, of this company, has been closed for some months. The large Hampshire mine, now owned by Davis Brothers & Elkins, has been closed for months.

The large Potomac mine at Barton, owned and operated the last three years by the Messrs. Black, Sheridan & Wilson, has been making a steady run since last spring, employing over 200 men. The monthly output has averaged about 20,000 tons.

## PENNSYLVANIA.

The Wilkes-Barre *Telephone* furnishes the following notes: It is now confidently believed that the interior fire at the Dorrance colliery of the Lehigh Valley Coal Company is entirely extinguished. The large supply reservoir for the Dorrance colliery is almost entirely completed. The improvements effected about this mine are many, and it will ultimately be one of the most prosperous in the Wyoming region.

It has been decided by the West End Coal Company to erect a trestle from the mountain to the Teasdale breaker, at Shickshinny. It will run from an opening in the coal-seams that has been recently effected, and over this trestle will be transported the coal, etc. The contract for the work was given to Joseph C. Tyrrell, of Forty Fort, who will soon begin the work. The trestling will be something over 500 feet long, and at one place will reach a point of about 82 feet. The work will be as substantial as the best workmanship can accomplish, and will be completed in a few weeks. Other improvements for this colliery are under contemplation.



**GAS AND PETROLEUM NOTES.**

Exports of refined, crude, and naphtha from the following ports, January 1st to September 19th :

	1885.	1884.
	Gallons.	Gallons.
From Boston .....	6,773,391	5,167,695
Philadelphia .....	106,713,327	62,523,802
Baltimore .....	8,524,140	9,931,339
New York .....	272,272,047	270,300,298
Total exports .....	394,282,905	347,923,134

**GENERAL MINING NEWS.**

**ARIZONA.**

**CROCKER, PEER, AND PEERLESS.**—Superintendent W. H. Smith, in an official report, dated September 14th, says: The uprise from Crocker north drift has been stopped, owing to bad air. Stopping has begun on the ore-body at this point, which looks well. Work has been resumed on the winze at the south end of the Peerless ground, to connect with the uprise from the Crocker north drift. Ten stamps are working very satisfactorily. There is ample supply of water. The pumping machinery is in excellent order. The melting-furnaces will be in order to-morrow, and the molding of bullion will begin at once.

**CALIFORNIA.**

We are indebted to the courtesy of Mr. J. B. Randol for the following statistics of quicksilver produced in California during August :

	1884.	1885.
	Flasks.	Flasks.
Mines.		
Etna .....	228	118
Napa Consolidated .....	110	175
Great Western .....	334	324
Guadalupe .....	306	...
New Idria .....	63	80
Sulphur Bank .....	20	150
Redington .....	47	49
Great Eastern .....	47	...
Various .....	...	...
New Almaden .....	1108	2104
	2912	3047

**BULWER.**—The Bulwer half of the Standard-Bulwer mill, excepting the batteries, has been leased to the Standard Company for working tailings for thirty days, at \$20 a day, beginning on the 15th inst. Number of men employed, 9.

**MONO.**—The joint uprise from the 400 Mono (level) is up 9 feet. The south drift from No. 1 winze, 100 feet below the 550 (Lent shaft) level, is in 7 feet. We find some good ore in this drift. During the week, we have shipped 180 tons of ore from this mine to the mill. Fourteen men are employed.

**STANDARD.**—The retimbering of the shaft at the 400 level and the station at the same will be completed on the 14th inst., when work on the ore-bodies will be started and the raising of ore resumed. Total men employed, 32.

**CANADA.**

**PROVINCE OF NOVA SCOTIA.**

The largest bar of gold ever seen in Nova Scotia was brought to Halifax from the New Albion mines, at Montague, September 22d. It weighed 1054½ ounces, being the product of fourteen days' crushing in a twelve-stamp mill, and is valued at \$20,618.

**COLORADO.**

The Leadville *Herald* reports the following :

**CHRYSOLITE.**—The strike of ore recently made in this mine consists of brownish iron and black carbonate and sulphate of lead. The mineral was encountered in making a rise from a drift driven 250 feet north of the Roberts shaft, and eighty feet west of the Little Chief line. The rise passed through twenty feet of iron, and encountered the ore. Since striking the ore, the rise has been continued about nine feet farther, while the top or roof is a fine mass of solid mineral, giving no evidence of any limit, and there is as yet no clue to the possible thickness of the ore-body. All four sides of the rise show equally high grade ore. The ore obtained in making the rise amounted to over ten tons, which was sampled as it was hoisted from the mine. These car samples returned an average of 73 ounces in silver to the ton, and 15 per cent in lead. The discovery is in a virgin piece of ground, with no developments on this level nearer than 100 feet. The character of the ore, the nature of its surroundings, and other features usually accepted as infallible indications, all point to the probable existence of a large and rich ore-body, such as Marden opened soon after Mr. Keyes resigned the management of the mine, and from which several hundred thousand dollars were extracted. The miners who are employed in the mine, and who worked in the Marden, and subsequently in

the Rolker or Beer rise stopes, declare the ore to be identical with that found in those large bodies. The new discovery is to the north of the Marden stopes, and to the east of the Beer rise workings, and may possibly be found to connect with one or both of these formerly large and rich ore-bodies. The rise will be advanced as rapidly as possible, in order to determine the thickness of the ore. When this is done, drifting will begin, and stoping of the ore will soon follow. The new prospect-shaft, known as Vulture No. 9, is down 126 feet, of which 70 feet were through alluvial deposits, 41 feet through porphyry, and 14 feet in limestone. As dolomite sand or lime-rock frequently overlies the ore-bodies of Western Fryer Hill, the prospect is still a good one, and may realize the expectations of Manager Clark.

**EMMET.**—The most satisfactory and paying lease on the Emmet is held by Messrs. C. F. Krimmel, William McCafferty, and others. It is designated as lease No. 2, and covers quite an area of ground just west of the Columbia tunnel. So far this month, lease No. 2 has shipped 200 tons of ore, and the lessees informed a reporter that their shipments during September would unquestionably exceed 500 tons. Much of the ore runs up in the hundreds of ounces, and the average of the shipments for the entire month is expected to exceed \$50 a ton, or a total of \$25,000.

**IRON SILVER.**—The concentration-mill, erected for experimental purposes, is a curiosity. On the lower floor are ten jigs, embracing four or five different styles or makes of the plunger pattern. In some of the jigs, the motion is imparted to the plunger by eccentrics, in others by revolving triangles, while still another jig is operated by cams and springs. The machines built on the premises do the best work and are the best proportioned, while the worst excuse for a jig is a trap sent to the company for trial from Detroit, Michigan. The mill shows its temporary and experimental character throughout, and should be rebuilt as soon as the object of its construction is attained, which was, to prove that the low-grade ores on the Iron mine dump can be economically concentrated into valuable product. The crushing machinery of the mill is very defective, and there can be but little doubt that a new mill, crushing to a proper fineness, would do 30 per cent better work than is now done. The mill, we are informed, handles about thirty tons of ore a day, producing four tons of concentrates, ranging in silver from 12 to 20 ounces to the ton, and carrying from 20 to 45 per cent in lead. The grade of the product varies largely, depending on the jigs producing it, and the size to which it has been reduced.

**KITTY CLYDE MINING COMPANY.**—This company has been incorporated under the laws of the State of Colorado. Operations will be carried on at Idaho Springs, with the principal office in New York City. The incorporators are Joel W. Stearns, Thomas B. Stearns, and William C. Hough. George S. Raymer and Thomas B. Stearns are the resident agents for Colorado.

**LA PLATA.**—This company is making the first attempt at Leadville to desilverize base bullion. The cupelling-furnace is under the direction of Mr. L. L. Humphreys. He has been connected with the Swansea smelter, of England, in the cupelling department, and was called to this position on account of his superior knowledge and experience in this line of work. The furnace is erected after the style of the English cupelling-furnaces, and has a capacity of five tons in twenty-four hours. The result of the cupellation of the base bullion is an oxide of lead product containing 89 per cent of lead and 3½ ounces of silver. This yield is subsequently added to ore charges deficient in lead, and will obviate the purchase of lead ores at other than profitable prices for the reduction-works. The base bullion before being desilverized averages about 300 ounces in silver to the ton, and the subsequent bullion product is about 700 ounces to the ton. Five or six more cupelling-furnaces are at once to be added to the smelting plant of the La Plata Company. The mine of the La Plata Company is reported to be looking very well, and showing some extensive ore-reserves. The mine during August produced nearly 800 tons of ore, and the indications are, that this month the product will reach 1000 tons. The annual stockholders' meeting of the company will be held in London in a few weeks, when reports will be submitted showing the company's operations during the past year, and its present financial standing. It is expected that a small dividend will be declared.

**MORNING STAR.**—Recently, an extension of the iron ore-body now so successfully worked in the Evening Star, was encountered, being at present two feet thick, and carrying 20 ounces of silver per ton, with an excess of from 45 to 50 per cent in iron. The body is pitching to the west, and is apparently a continuation of the fine iron ore-body struck over a year ago in drift 32 feet from the McHarg shaft. This iron, as has been reported before, lies from 20 to 30 feet underneath the lead ore in the upper contact.

**ROBERT E. LEE.**—The large new sinking-pump for the Robert E. Lee mine is expected to arrive by the middle of September, and will be placed in position at once. The product of the mine at present is limited, but will soon be increased. A number of men are employed in surface improvements, and the property is evidently preparing for a large production in the future.

**GRAND VIEW SMELTER.**—The Dolores *News* says that this smelter will blow in soon, and Manager Grier-son tells us will run all winter if people will bring them sufficient ore to run on. The roaster, which has been operating on ores for some time, will be allowed to finish before the new furnace, one of the best in San Juan will blow in. Two cupelling-furnaces will be put up, as soon as masons can be secured to do the work. Four Frue vanners will be put up either late this fall or early in the spring, and will give a capacity for concentration of 20 tons daily. Ten stamps for use in conjunction with the vanners are already in place. Sampling of ores is done daily, and the preparations which have been making for this run are now brought to a close, and the run is to be made.

**REDUCTION-WORKS FOR ASPEN.**—The Aspen *Sun* says: That Aspen is to have reduction-works there is now a full assurance. A company backed by prominent officials of the Union Pacific Railroad is in part organized, and with which H. B. Gillespie and J. E. Boss, of Aspen, are closely identified. The plant is to cost \$75,000, part of which has already been ordered—such as a large engine and 49 or 50 stamps. It is not yet decided what the treatment of the ore will be after the ore is pulverized by the stamps. The company has two methods under consideration—lixivation and concentration. A car-load of ore is made up as follows to send to Denver to be tested with the Matchless concentrator: 2 tons from the Spar mine, 2 from the Enterprise tunnel, 1 from the Morning and Evening Stars, 1 from the Traynor, 1 from the Buckhorn, 1 from the Smuggler, and 1 from the J. C. Johnson. This will cover nearly every class of ore in the camp. Next Messrs. Gillespie and Boss will go to Denver, where they will be joined by Mr. Chalmers West, of the Fraser & Chalmers Mining Machinery Company, of Chicago, and Mr. Choate and another gentleman connected with the Union Pacific Railroad.

**STAUNTON ENGINEERING COMPANY.**—The Georgetown *Courier* says: Eight loads of concentrates went away from the Farwell mill, at the beginning of the week, and afforded ocular proof that the company had saved something out of the first 100-ton lot of Colorado Central ore just treated on the company's two Golden Gate concentrators. We are unable to give the precise percentage of saving, but understand that it was quite satisfactory. The novel device of pumping the tailings off the top of the table, near the center, seems to favor the bedding of more float sulphuret ore than the ordinary machines, which discharge their tailings over one end and thus allow much of the finest and most valuable mineral also to escape. The Golden Gate machine appears to be so arranged that the mineral has every opportunity to settle, without any considerable chance of being stirred up again by the additional flow of new pulp or water. That large quantities of float ore are settled and held by the heavier mineral, can be readily proved by blowing upon the top of the ore-bed and scattering the lighter rock there. Immediately the sulphurets rise and float off with the worthless gangue to the pumping cross-pipe. It would seem that a more effective crushing plant is necessary. In fact, it is almost a wonder that the present much used crusher, rolls, and stamps have not snuffed out the light of the young company at the very start by frequent breakage and consequent delay. With high-speed crushing machinery, such as we understand is tendered the management, and four concentrators, from 100 to 150 tons of crude ore can be treated daily, at almost the same cost as 40 tons can now.

DAKOTA.

CALEDONIA.—The superintendent reports as follows: The large header on the 425-foot level is in from the foot-wall 35 feet. The quality of ore continues good, and without a doubt we have a large and fine body of ore. We shall soon be able to run the entire mill on ore from the lower level, which will increase our bullion output. Total number tons of ore milled, 1207. Product for the first two weeks in September, \$13,000.

FATHER DE SMET.—The superintendent reports as follows: Total product for the month of August, 2036 ounces of gold. The condition of the mine continues good, and while the general character of the ore is rather low, the outlook, considering the immense size of the ore-bodies, and the natural facilities for working, is very favorable. The connection just made between the third and fourth levels shows that there is a considerable amount of pay ore below the former level, which, no doubt, will be found continuing down to the latter point when that level is extended farther south. The ore extracted and milled during the week ended September 15th was 2150 tons.

IDAHO.

BOISE VALLEY CANAL COMPANY.—This company has been incorporated under the laws of Utah for the irrigation of lands, manufacturing and mining in Idaho, holding property there, and doing such other business as is legitimately connected therewith. The company owns considerable lands and valuable water-rights in and near Caldwell, Idaho. Twenty years is the corporate existence of the company named in the articles, and the capital stock is \$200,000, divided into 20,000 non-assessable shares at the par value of \$10 each. Salt Lake City is designated as the principal office, and Caldwell, Idaho, is to be the general place of business. George W. Roberts, of Nebraska, is President and Manager; S. L. Haskell, of Caldwell, Idaho, General Superintendent; George Little, of Caldwell, Idaho, Secretary; F. E. Shoppe, of Salt Lake City, Vice-President; and George W. Roberts, of Denver, Colorado, Treasurer. The above-named gentlemen constitute the board of directors for the ensuing year, and each has subscribed for 2500 shares of the stock, and J. F. Corker, of Salt Lake City, has taken 10 shares. Seven thousand four hundred and ninety shares of the capital are reserved as a working capital.

VIENNA.—The Wood River Times says that there is a large force of men—about sixty—working in this mine. The mill will start up soon, and continue to run all winter. The ore-house is full to overflowing, with a great deal more ore in sight. A rich and extensive body of ore has been found at the bottom of the shaft, the lowest depth attained.

MEXICO.

A press dispatch, dated Paso del Norte, Mexico, September 20th, says: The recent reports of the discovery of vast deposits of silver ore in the Sierra Madre are fully confirmed by experts who have visited the place. Old miners from New Mexico, Arizona, and California are passing through here every day en route to the new Eldorado. Great quantities of native silver of high grade have been found near the surface, and it is this fact that causes American miners to seek the fields, which are difficult of access, and are situated about 110 miles southwest of here, in the Sabiral Mountains, which are a great spur of the Sierra Madre range. It is sixty miles to the nearest station on the Central road. As many as 400 Americans are already at the mines or en route. All reports indicate that a new bonanza has been struck, the output of which will rival the celebrated mines of Nevada. The land upon which ore is found belongs to wealthy Mexicans who reside at Chihuahua; but under the mining laws of Mexico, any one can stake out a claim and hold it against all comers, provided he works it.

A special from Eagle Pass to Galveston, Texas, under date of September 22d, says: Confirmed reports have reached here of the confiscation of the Las Cruces silver mines in the Carmen Mountain, Mexico, by Mexican troops upon a trumped-up claim of a Mexican sergeant antedating the claims of Owens, Stapps, Davis, and other Americans. The sergeant produced his alleged claim, and the Mexican soldiers dispossessed the Americans and took possession. These are the mines whose discovery about six months ago led to much excitement, as they yielded 107 ounces of silver to the ton. The chances are against the American

owners again getting possession, as they are unable to litigate in the Mexican courts. United States Consul Fridgen, at Piedras Negras, is interesting himself in behalf of the American claimants with the hope of restoring them in the mines.

MICHIGAN.

COPPER MINES.

CALUMET & HECLA.—The Calumet News says: The report, for the year ended May 1st last, of the treasurer of the Calumet & Hecla Mining Company's Employes' Aid Fund was distributed among the subscribers on September 12th, from which it appears that the following sums were collected last year:

From the employes.....	\$11,589.25
Contributed by the company.....	11,589.25
	\$23,178.50

And there were paid out:

For deaths by accident (8).....	\$4,000.00
For accident pay, other than death.....	7,137.37
For sick pay.....	14,273.50
	\$25,410.87

Showing a deficit of..... \$2,232.37

This, however, was a little more than made up from the income account, as, besides the above collections, the treasurer received \$1930 dividends on 266 shares in the Calumet & Hecla, and \$635.25 interest on loans. The collections from the mines, contribution from the company, and income from the capital, therefore, just pay the outgoing.

The treasurer reports that he had on hand to the credit of the fund:

Cash.....	\$295.17
Bills receivable (loans).....	3,900.00
266 shares Calumet & Hecla (cost).....	56,806.32
	\$61,001.49

Notwithstanding the good purchase made in November last, when 66 shares were bought at about \$150, the 266 shares at the present price would about realize the amount they cost. The above-mentioned fortunate sale has brought down the average cost considerably. The amount of the sick pay speaks volumes for the good this aid club is to the men, as the sum paid represents so much capital that the employes would have lost had it not been for this club. The number of deaths by accident is large, owing to the fact that three persons lost their lives by suffocation in the fire of last October. The munificence of the Calumet & Hecla in donating monthly as much as is collected from the employes themselves, is an example that we should like to see followed by other large corporations, and would, we believe, be a paying investment, as men are not so likely, in times of trouble and distrust, to do any thing that would be harmful to their employer's interest if they feel that their employer has the employes' interest at heart, as would be evinced by such institutions as the aid fund.

GOLD MINES.

ROPES.—The Ishpeming Agitator reports as follows: The results obtained with the Ropes mine stamps and pulverizer for the month ended September 7th are the best in the history of the mine, 900 ounces of amalgam being taken up. Most of the rock milled came from the second and third levels, and proves that the vein holds its richness. The Ropes mine looks better than at any previous time in its history. In the bottom of the shaft, 190 feet from surface, a very rich streak has been encountered that continues in the drifts east and west of the fourth level as far as mining has been prosecuted. The vein here has a width of five feet. A quantity of this rock can be seen at Mr. Ropes's office, and assays of averages of many pounds give him from \$75 to \$100 a ton. The Wiswell pulverizer has done better work than the stamps the past month, and shows that all it needs to make it a superior machine is the improving of the bed plate, which was previously made too light and of too soft an iron.

IRON MINES.

The following statement, published by the Marquette Mining Journal, shows the amount of iron ore and pig-iron shipped from the lake ports of that district for the season, up to and including September 16th:

	Gross tons.
Marquette—Iron ore.....	526,250
L'Anse—Iron ore.....	19,136
Pig-iron.....	5,078
St. Ignace—Iron ore.....	69,791
Pig-iron.....	4,161
Escanaba, Marquette District—Iron ore.....	394,654
Menominee District—Iron ore.....	511,686

The week's shipments of iron ore from the ports of Marquette, Escanaba, and St. Ignace bring the total for the season up to 1,521,517 gross tons, 447,345 tons less than the lake output of our mines on the correspond-

ing date last year. During the week ended Wednesday, there were sent forward from the ports named 76,778 gross tons, 36,605 tons of which went via Marquette, 36,794 from Escanaba, and 3379 from St. Ignace. For the same week in 1884, the shipments amounted to 84,391 tons, or 7613 more than the quantity sent to market during the week ended with the 16th inst., from which it appears that we are still losing ground in the amount of ore shipped, in comparison with last season. The indications are, that the output of our mines for the current season will not exceed 2,000,000 gross tons, which would be the lightest achieved since 1880.

COLBY.—The miners have at last succeeded in finding both walls of the south vein of the mine. The vein is 146 feet wide, all clear ore. The mine continues to ship at the rate of a thousand tons of ore a day.

MONTANA.

The Helena Herald says: A syndicate of Connecticut capitalists, which has been developing the Mollie McGregor and Adolphus leads, in the Boulder District, by extensive improvements, has just received an extension of the bond, which will take effect on the first of next January, of \$65,000. The company has expended \$48,000 in a shaft of 210 feet, levels, concentrator, and hoisting-works. This valuable property is located about 2½ miles from Captain Cooke's old place, at the foot of the Boulder divide, and about one mile south of the Rumley and Comet mines, on Boomerang Gulch. The owners of the property are A. G. Clarke, Charles D. Curtis, James P. Porter, John B. Taylor, James R. Boyce, Jr., and John H. Curtis, of Butte. The amount of money expended by the syndicate, which is incorporated under the laws of Connecticut as the McGregor Mining Company, insures the sale.

MAIDEN MINES.—The mines mentioned as having been bonded for \$50,000, says the Benton River Press, are the Black Bull, War Eagle, and Alpine. The conditions are, that work is to begin at once, and \$400 worth of work to be done in sixty days, and continue. Payments to be made as follows: \$10,000 in six months, and \$40,000 in twelve months, the parties bonding to have the privilege of working 100 tons of ore.

NEVADA.

BLUE JACKET.—The Tuscarora Times says: Mr. Milford and Mr. Johns report every thing progressing as favorably as could be desired at this mine and mill. The stamps are crushing an average of 15 tons in twenty-four hours, at present; but upon a proposed rearrangement of the batteries, it is expected that the capacity will be increased to 25 tons. The ore for the last two weeks by the wet process has averaged \$42 a ton. The last few bars that have been shipped have contained sufficient gold to pay the expenses of expressage. Until lately, the assays have been made only for silver. The tunnel is driven ahead through the mountain to the White Rock side, and it is estimated that the face is within 300 feet of daylight at that end. As soon as a survey can be made, it is proposed to begin running from the White Rock side, as at present the debris has to be conveyed 1500 feet, which is the present length of the tunnel. The gentlemen inform us that at least 16 cords of wood a day are saved by the adoption of the wet process, which in every respect has proved satisfactory in its operation.

COMSTOCK LODGE.

The Virginia City Chronicle reports the following: CONSOLIDATED CALIFORNIA & VIRGINIA.—From the 1750 level, 770 tons of ore were extracted during the week ended September 12th. Of ore, 810 tons were shipped to the Morgan mill that gave an average assay value of \$13.85 a ton, which is \$1 below the value of that shipped during the week ended September 5th. The water at the C. & C. shaft is now within ten feet of the floor of the station on the 2000 level. It is rising very slowly, and will probably never flood that level. Very little ore has been extracted under the Jones contract during the week, and none has been shipped, on account of the Eureka mill being shut down for repairs. They are opening out the vein between the 1200 and 1400 levels, and will be ready to stop out ore from the breasts when the mill is ready to crush it. The Consolidated Virginia shaft has been shut down since last Saturday, and extensive alterations to the hoisting machinery are in progress. These will be completed the latter part of next week, after which the ore taken out under the contract will be hoisted through that opening.



**HALE & NORCROSS.**—The situation on the 3100 level is said to look decidedly encouraging. The south-east drift from the deep winze is out 40 feet from the station, the last 20 feet in ore. It has been swung around to the westward, until its course is now only a trifle east of due south. The assays from the face this morning show about the same value as those taken heretofore. The west drift is out 25 feet from the station, and is running a little south of west. On September 11th, the vein porphyry was passed through, and the face is now in mineralized quartz, selected samples of which assay \$150 a ton. The distance across from the face of the west drift to the nearest point in the south drift is over 100 feet. As both drifts are now in ore, it gives a body 100 feet in width, provided the space between the two drifts proves to be all ore.

**SIERRA NEVADA.**—West cross-cut No. 1, started at a point in the north lateral drift 1000 feet from the shaft on the 520 level of the Sierra Nevada, is out 259 feet. Last week, the drift, which had hitherto been perfectly dry, showed signs of moisture, but there was no change in the formation in the face, which continued in hard rock. On September 14th, the ground grew softer with every foot advanced, and the next day the drift passed entirely out of the hard-rock belt, which it had been cutting for the last 150 feet, into vein-matter of a decidedly favorable character, consisting of soft porphyry, streaked with numerous stringers of strongly mineralized quartz. These stringers are no doubt the feeders of a vein lying farther west. As the foot or west wall still lies 200 feet beyond the present face of the opening, there is plenty of room in the intervening space for a large body of ore.

**SUTRO TUNNEL.**—It is proposed to utilize the water flowing from the tunnel for motive power to drive quartz mills for crushing the low-grade ore cut several hundred feet west from its mouth. The fall from the mouth of the tunnel to the head or west end of Florence avenue, in the town of Sutro, is about 70 feet; the fall from the tunnel mouth to the Carson River is something over 168 feet. The water pressure required to drive the Leffel wheel at the Eureka mill is a fall of 39 feet. With that fall, five forty-stamp mills could be erected between the mouth of the tunnel and the river, with a total crushing power of 600 tons in twenty-four hours. The ledge of low-grade ore cut through in driving the tunnel is between 400 and 500 feet in width and gives an average assay of nearly \$5 a ton. The building of trestles for flumes and tracks and the construction of the mills will begin next spring.

**NEW YORK.**

**AMERICAN BOURSE.**—The certificate of incorporation of this company has been filed with the New York County Clerk. It has a capital stock of \$10,000, divided into 1000 shares of \$10 each. The incorporators and trustees are William Ward, George Tuthill, Charles F. Roper, William H. Clark, David Tomlinson, Frederick G. Wheeler, Walworth Ward, Charles S. Medary, Philip W. Holmes, Newton S. Finney, Richard L. Ogden, and Norman A. Smith. This company has been formed for the purpose of organizing a stock and petroleum exchange without the insurance feature which is found burdensome in some other organizations. The incorporators are well known business men, some of whom have had large experience in this particular department. William Ward originated the New York Mining Exchange, out of which the present petroleum exchange has grown. Mr. Tuthill succeeded Mr. Ward as president of that board, while Mr. Ogden was one of the originators of the first stock exchange in San Francisco.

**UTAH.**

**LEACHING-WORKS AT SILVER REEF.**—These works have been running steadily for forty days and nights, leaching 27 tons of tailings every twenty-four hours during the time. It is the intention of the Leaching Company to begin work on its new plant during the first part of September. The new works will have a set of Cornish rolls attached for crushing ore, and the capacity will be 75 tons a day. The company will depend principally on custom ore, and chloriders will receive terms that will enable them to work ore that before was sent to the dump as waste. A year's experience in the way of practical work leads the manager to feel sanguine of success, and the prevailing opinion is, that our low-grade ores can be profitably worked by this process. Tailings, carrying 8½ ounce-silver, have been advantageously treated. The incen-

tive already given to the mining industry is favorably felt by the business interests of Silver Reef, inasmuch as low-grade mines heretofore worked just enough to keep up the assessments are now systematically opening up.

**LEEDS.**—This mine has been leased to Mr. John Hall.

**STORMONT.**—The overflow of the Virgin River filled the water-ditch at the River Mill with drift-wood and debris, causing the battery to remain idle from Saturday until Wednesday. Two extra pans have been put to work, and the stamps are kept dropping for a few extra hours each day, so that the lost time will be regained and the regular quantity of ore run through during the present month.

**BULLION PRODUCTION FOR 1885—SPECIAL OFFICIAL REPORTS.**

MINES.	States.	Month of August.	Year from Jan. 1st, 1885.
Adams, s. l.	Colo.	58,182	241,103
Alice, g. s.	Mont.	22,616	658,562
Belmont.	Nev.	6,057	10,003
Bodie, g.	Cal.	23,909	**17,967
Boston & Montana, g.	Mont.	39,373	328,467
Christy, s.	Utah	9,273	170,279
Chrysolite, s.	Colo.	46,829	44,710
Colorado Central, s.	Colo.	82,228	159,616
Consolidated Bobtail, g.	Colo.	126,472	41,228
Deadwood-Terra, g.	Dak.	15,600	293,889
Deer Blue Gravel, g. s.	Cal.	31,504	95,181
Essex, g. s.	N. S.	26,725	6,474
Eureka Consolidated, s. l.	Nev.	75,200	180,619
Father de Smet, g.	Dak.	82,228	230,474
Freeland, g. s. c.	Colo.	15,600	223,729
Grand Prize, s. g.	Nev.	26,725	206,318
Granite Mountain, s.	Mont.	75,200	688,700
Hall-Anderson, g.	N. S.	82,228	7,741
Head Center & Tranquillity.	Ariz.	82,228	85,396
Hecla Consolidated, g. s. l. c.	Mont.	126,472	*584,077
Helena, g. s. l. c.	Mont.	15,600	473,584
Homestake, g.	Dak.	126,472	830,679
Hope, s.	Mont.	15,600	107,446
Iron Silver, s. l.	Colo.	75,200	332,006
Kentuck, s.	Nev.	621	3,562
Lexington, g. s.	Mont.	73,284	578,096
Montana, Limited, s. g.	Mont.	74,000	573,317
Moulton, s. g.	Mont.	310,732	310,732
Mount Diablo, s.	Nev.	325,231	325,231
Navajo, s.	Nev.	82,804	82,804
New Hoover Hill, g. s.	N. C.	8,750	52,319
New Pittsburg, s.	Colo.	9,504	9,504
North Belle Isle, s.	Nev.	2,118	2,118
Ontario, s.	Utah	114,867	*1,228,977
Oxford, g.	N. S.	4,315	12,175
Plymouth Consolidated, g.	Cal.	73,157	649,006
Rooks, g.	Vt.	1,168	28,383
south Yuba, g.	Cal.	1,168	1,168
Standard Consolidated, g.	Cal.	18,724	121,422
Stormont, s.	Utah	11,891	109,204
Syndicate, g.	Cal.	62,327	**62,327
Tombstone, g. s. l.	Ariz.	403,875	403,875
Total			10,621,708

G., gold; S., silver; L., lead; C., copper. Silver valued by the different companies from \$1@\$.29 per ounce; gold, \$20.67. \*Not including value of lead and copper. †Royalty. ‡Net. No shipments during month mentioned. \*\* Not official.

**MARKETS.**

**NEW YORK, Friday Evening, Sept. 25.**  
**Silver.**

DATE.	London.	N. Y.	DATE.	London.	N. Y.
	Pence.	Cents.		Pence.	Cents.
Sept. 19	47½	102½	Sept. 23	47½	103½
21	47 5-16	102¾	24	47½	103½
22	47 5-16	102¾	25	47½	103½

An advance in India exchange with some continental demand for silver has arrested the declining tendency of last week in London, and given tone to the market at the better rates of accompanying table. It is not improbable that London has unduly discounted the chances of a suspension of purchases of silver by our government.

The London *Economist* of September 12th says: For the cause of the decline it is not necessary to search far. In the main, it is only the old cause—apprehension as to the future of silver—which has been in operation for years, but which has recently been revived and intensified by the agitation in the United States against the continued coinage of silver and by the threatened disruption of the Latin Monetary Union.

The effect of that repeal would, of course, be to put a stop to the purchase of silver by the Treasury, and to throw upon the market the £5,000,000 worth of the metal which it absorbs annually. This large addition to the market supplies, moreover, may, it is thought, come at a very inopportune time. The Latin Monetary

Convention expires at the close of the present year, and as yet the negotiations for its renewal have proved abortive. The great obstacle in the way of its prolongation is, that France wishes all the powers constituting the Union to come under an engagement to take back at their full value all the silver coins they have minted. To this Belgium rightly objects, because the Brussels mint, having been freely opened to the coinage of silver, has been used to provide coin not for Belgium only, but for the other states forming the Union as well. Out of this coinage Belgium made no profit, and she contends that it is unreasonable to ask her to bear the loss resulting from the depreciation of the silver currency she minted gratuitously for her neighbors.

With such currency changes believed to be impending, it is not surprising that the silver market should have given way. And it would be rash to affirm either that the fall is not justified, or that it will not become still more pronounced. There are, however, reasons for believing that the apprehensions entertained as to the future of the silver market are exaggerated. That the compulsory coinage of silver in the United States will soon be suspended, we hope and expect, and the anticipation of a large addition to the market supplies of the metal from this cause is, we think, well founded. But it is different with the fears that are entertained with regard to the Latin Monetary Union. It is to be remembered that for years past the mints of the Union have been closed against the coinage of silver. In this respect, therefore, the dissolution of the Union would leave matters just as they are at present. And, as regards the demonetization of the metal, even if that did take place, it would be more a nominal than a real change. Silver might be reduced to the rank of a token currency, and made legal tender only to a limited amount; but it may be taken for granted that there would be no attempt to cast it from circulation, and it would in all probability continue to circulate almost, if not quite as largely, as at present; not only because it is a currency to which the people are accustomed, but also because there is none of the states forming the Union which would willingly face the expense of withdrawing it, and issuing gold in its place. Thus, even if the Union is not prolonged, its disruption is not likely to have much influence either upon the demand for or the supply of silver. But the probability is, that it will not be broken up. Before the end of the year, some working arrangement of a more or less temporary character will most likely be arrived at, because all the powers will be inclined to postpone a final decision until the effect of the expected stoppage of the American coinage of the metal can be seen.

This high authority thinks that the depression is temporary, and that new markets in China, in Japan, and in India will be able to take our surplus should we cease to coin as under the present law. There is no probability of the proposed Warner bill ever becoming law.

The United States ships *Swatara* and *Yantic* have arrived from New Orleans at the Capes of the Chesapeake, loaded with ten million standard silver dollars. A large number of wagons and an extra police patrol are arranging to convey the money to the Treasury when the ships reach Washington.

**Foreign Bank Statements.**—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate of discount, and it remains at 2 per cent. During the week, the bank lost £489,315 bullion; and the proportion of its reserve to its liabilities was reduced from 42½ to 41½, against 44½ per cent at this date last year. The weekly statement of the Bank of France shows gains of 3,865,000 francs gold and 2,143,000 francs silver.

**Copper.**—The copper market in London appears to be greatly demoralized, and unduly so. Chili Bars have reached the unprecedentedly low figure of £40 7s. 6d., at which figure the market closed to-day, though private cables report £40 5s.; Best Selected, £48 10s. The reason for this enormous decline appears to be the fear of a deluge of copper from this country. Such a fear is quite unreasonable. The only new prospective producers are the Lower California mine held by the French; the Grand Bell Company, in Texas; and the Tamarack Company, on Lake Superior. The California concern is building 8 furnaces, but its supply of rich ores is said to be

about sufficient for one 30-ton furnace, and its low-grade ores will scarcely pay to work at present prices.

The Grand Belt Copper Company is finding an expected difficulty in smelting that is likely to prevent it from being a disturbing element in the market, and as the season of navigation is approaching a close, there can but little copper come from the Tamarack this year. It is true that Calumet & Hecla has increased its output, but a number of lake mines have stopped. The Arizona Queen-Atlanta is in a position to produce more largely than the Queen was, but both the Arizona and Montana mines can find no profit in the present prices. Arizona bars, 96 per cent, are selling here at 8½ cents, and after deducting freights from the Old Dominion, can leave only about 6 cents for the copper at the mine. Montana matte brings here but 7½@8 cents a pound of fine copper contained, which can scarcely leave more than 5½ cents for mining, concentrating, smelting, and general expenses, and we greatly doubt whether any concern in Montana is paying expenses at that price, which is equivalent to \$11.50 per ton of 10 per cent ore. And even these prices are based on exceptionally low freight rates—\$18@ \$20 a ton for a distance of about 3000 miles and three transshipments.

Any disturbance in these would make the showing still more unfavorable for working. Moreover, should the Anaconda proprietors propose closing, they have the means to more than recoup themselves through the advance this would bring in the market, and such an eventuality is not beyond the range of possibility. It is, therefore, possible that copper has reached bottom abroad. Certainly, there is no ground for the tumble in price so far as the output from this country is concerned.

It is known that there is very little copper in stock in the country. In this city, less than half the usual amount is in store, and there is a large and steady consumption, which will grow in many directions when the influence of improving business throughout the country becomes felt.

The present quotations are: Lake, 11c.; at the Metal Exchange, it is quoted 10½c.; Orford and Baltimore, 10½c.; Arizona brands, 10½c. And the lateness of the season and low stocks leave little probability of any serious reduction from these figures, though at the present price of Chili Bars, Calumet & Hecla would get only about 9½c. on its contract.

**Tin.**—The London market declined during the week to £90 10s. for spot, and has advanced again to £91 2s. 6d., at which it closes to-day, as by cable to the Metal Exchange.

In this market, the price has fluctuated between 20.55@20½c., with a quiet market.

**Lead.**—This market is firm and quiet at 4¼c., at which figure sales aggregating 1200 or 1300 tons have been sold during the week. Of this amount, 540 tons were Richmond lead, to arrive via Panama about October 12th. The Richmond Company has about 500 tons more *en route*.

The "C. C." has disposed of a good deal of lead, and is supposed to hold not over 3000 tons now. Consumers are well supplied for October, and at the present time the market is dull, with lead offering at 4¼c., firm, and none wanted.

The statistical position is still strongly in favor of producers. The "C. C." lead pipe is selling at 4.80c., at which price the manufacturers are probably doing business "for the fun of the thing."

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

Our market remains about the same as last week, if any thing, a shade weaker. Sales for the week are 500 tons Refined at 4.12½c., and 200 tons Chemical at 4.10c.

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

Scarcely any fresh business has been done since our last report, and our market has ruled dull, with transactions of a limited character. Prices have ranged from 4.15@4.17½c., although we hear rumors of lead offering at 4.12½c. Sales for the week aggregate 250 tons at 4.17½c., and 180 tons at 4.15c.

**Spelter & Zinc.**—Domestic Spelter is selling at 4.40@4.62½c., and Foreign at 4.87½c., with the market quiet but strong, and somewhat better in the West than here.

In London, Sillesian is quoted to-day £14 7s. 6d. Sheet-Zinc is higher, and may be quoted 5.65@5.85c.

**Antimony.**—In London, Hallett's is quoted £36,

and here the market is quiet at 9@9½c. for Hallett's, and 9½c. for Cookson's.

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Sept. 25.

**American Pig.**—The improvement in business has shown itself in this article in quite large sales. During the past week, some of the companies report for the week the largest sales ever made in the history of the companies—the most encouraging and cheerful report we have had to chronicle for many a month.

Prices remain unchanged, being, for standard brands Lehigh, \$18 for No. 1 X, \$16 for No. 2 X, and \$15 for Forge, with fancy brands occasionally asking 50 cents more, and less approved makes selling \$1 below these figures.

The Thomas Iron Company blows in its seventh furnace, but makes no change in prices. We hear of large contracts for foreign ores, mostly Spanish and Algerian, at from 7½ cents to 9¼ cents per unit.

It seems strange that the immense deposits of Nova Scotia have not been drawn upon. Should our government adopt any measure of reciprocity with Canada, by which the iron ores and coals and cokes of Nova Scotia could come in free, it would, no doubt, considerably benefit our Eastern iron-masters.

**Scotch Pig.**—About 800 tons of Scotch pig have come in during the week. Though the market is quiet, it is stronger, and prices somewhat firmer at \$19.50 for Coltness, \$19 for Summerlee, and \$18 for Eglinton.

In Glasgow, the cable quotations to-day were 50s. for Coltness and 42s. 3d. for Eglinton. We hear of Scotch pig for some of the Southern States.

**Bessemer Pig and Spiegeleisen.**—Prices are somewhat firmer at \$16@18 for No. 1 Domestic; 20 per cent Spiegel is quoted at \$25.50@26, with sales of several thousand tons.

**Steel Rails.**—Prices appear to be firmly held at about \$30 at Eastern mills, and as most of the mills are well supplied with orders, there is no great temptation to cut the general quotation.

Some of the makers are already talking of getting \$35 a ton next year; but this is subject to too many contingencies to be a safe foundation on which to build. We hear of a contract for 15,000 tons to a Western mill.

Other departments of the steel business are not doing as well as steel rails. We hear of quite large orders, aggregating several thousand tons, of machinery steel bars and rods (largely for reaping-machines and similar use), selling at Chicago and some other points West at \$35 a ton, which is very much below generally accepted quotations.

**Old Rails** are scarce, and are sought for at from \$17@18 here.

**Merchant Iron.**—We quote: Common, 1.50c.; Refined, 1.75@1.90c.

**Structural Iron.**—There is a fair business doing at prices the same as we have quoted for a few weeks past. Angles, 1.90@2c.; Tees, 2¼@2½c.; Beams and Channels, 3c.

Philadelphia, Sept. 25.

[From our Special Correspondent.]

The usual receipts of ore are taking place. Prices are steady. Freights have varied but little for several months. There is a little increased activity at some of the mines in Eastern Pennsylvania and New Jersey. There is no certainty as yet that the productive capacity of the blast-furnaces will be increased.

**Pig-Iron.**—This week's sales show that the advance in prices has been accepted only in part. The demand has fallen off somewhat, whether because prices have advanced or because requirements have been covered it does not appear. Mill-owners and founders who have been interviewed in regard to the advance say that there is no occasion or room for it, but, nevertheless, quite a number of sales have been made at the higher prices. Special irons have been selling at \$19. Some standard brands have brought \$18.50, but \$18 represents the average figure for desirable irons. Sales of foundry iron have run up to 4000 or 5000 tons a week, and there are inquiries in hand which point to further sales, but not at the outside figures. There are a good many furnace companies willing to make iron at the advance that expect that it will be held. Ordinary foundries are selling at \$17@17.50. No. 2 has moved a little more freely all the week at \$15.50@16. Gray Forge iron is averaging \$15@15.50, with a little

more selling at the higher figure, and occasionally a lot of from 100 to 200 tons is sold a little higher. A good deal of ordinary forge iron has been purchased. The failure of the Shenandoah will have no influence on this market. The Pennsylvania furnace men point to the failure, and say that this is a sample of what may be expected of Virginia furnaces. The company is indebted on its first mortgage bond to the extent of \$500,000, to four or five banks and trust companies in this city. The total liabilities are put at \$900,000. The causes of the failure have not been fully explained, but the agents of companies here deny that iron was sacrificed or sold below current rates. There is considerable Virginia iron coming into this market, and it is well liked. Pennsylvania furnace men are looking into Virginia properties, with the intention of buying, but this failure will induce them to examine more carefully the outcome of Virginia furnace properties.

**Foreign Material.**—There is very little advance in Bessemer or Spiegeleisen, and prices are firm at the advance.

**Muck-Bars.**—Four or five hundred tons have been sold this week for early delivery at \$26.50.

**Merchant Iron.**—Fewer orders have been placed this week, and prices are higher. Medium irons that have been selling at \$1.50 are now held at \$1.60; Refined iron that has been selling at \$1.70 is held at \$1.80; Common iron, for which orders were sought at \$1.40, is now held at \$1.50. The mills through Eastern and Middle Pennsylvania are now engaged with orders running from one week to two months. The general situation is decidedly better than it has been. Two or three agents of interior mills say to-day that they have inquiries for a large amount of iron from parties who are anxious to place orders at August quotations.

**Nails.**—The nail-makers are selling small lots at \$2.30, and have orders for all the supplies they can turn out. Several Eastern customers are taking alarm at the continuance of the strike in the West, and are placing orders for winter delivery. The nail-makers are elated over the turn affairs have taken, but the unusual activity depends of course on the continuance of the lock-out in the West. From our best private advices, there seems to be no immediate probability of a shortage, and our nail-makers here are willing and anxious to book every thing that they can secure, at present figures.

**Slabs.**—A good deal of interest is felt in the new enterprise at Birdsboro', where nail slabs are turned out by the new process. The nail-makers of this State have been seriously contemplating the erection of steel-works for their own accommodation, but have deferred doing any thing until the outcome of the present experiment is known. The experimental blast was made this week with a one-ton converter, and from statements made, it appears that good nail-plate can be rolled by the direct process, avoiding the expense of blooming. Nail-makers will not be satisfied, of course, until a great deal of experimentation is gone through with. Slabs range from \$30@33.

**Plate Iron.**—Plate iron ranges from 2@2.10c.; Flange, 3.50c.; Fire-Box 4.50c. Several good-sized orders have just been secured, and the outlook is for an increased business.

**Sheet-Iron.**—All the sheet makers visited this week report a good run of orders, some of them quite large. Thin and heavy sheets are selling well, and orders for galvanized are coming in in a satisfactory way.

**Wrought-Iron Pipe.**—There is nothing new to report beyond the fact that discounts are firmly maintained, and an advance in prices is firmly talked of. Small buyers are obliged to pay for any accommodations in the way of early deliveries.

**Cast Pipe.**—The manufacturers of cast pipe are hurrying forward the last shipments of several heavy contracts, made early in the summer.

**Structural Iron.**—Bridge iron is selling at \$1.90@2.10; Beams and Channels, 3 cents. No very large orders have been acknowledged to have been received this week, but manufacturers say there is a steady run of small orders at outside quotations.

**Steel Rails.**—Steel rails are quoted at \$29@30, but the makers do not seem so positive of holding the market after January 1st as they have been. There are some elements of uncertainty in the rail situation, but it is too soon yet to speak with any degree of certainty as to the outcome.



**Old Rails.**—Old rails are selling at \$17.25@18, with every thing that can be delivered promptly.  
**Scrap.**—All kinds of scrap are in better request. Some irons run out of the selected line. Prices range from \$17@18, with lower grades at old rates.

**COAL TRADE REVIEW.**

NEW YORK, Friday Evening, Sept. 25.

**Statistics.**

**Production Anthracite Coal for week ended September 19th, and year from January 1st:**

Tons of 2240 lbs.	1885.		1884.	
	Week.	Year.	Week.	Year.
P. & Read. RR. Co.	266,388	7,708,762	328,804	7,709,743
L. V. RR. Co.	160,421	3,971,789	171,100	4,155,182
D., L. & W. RR. Co.	124,608	3,223,038	145,321	3,575,554
D. & H. Canal Co.	95,440	2,542,463	122,138	2,683,972
Penna. RR.				
N. & West Br. RR.	24,867	841,268	15,573	597,090
S. H. & W. B. RR.	4,233	161,575	915	132,960
P. & N. Y. RR.	12,167	291,682	16,124	291,738
Penna. Coal Co.	33,663	889,969	30,832	900,792
Penna. Canal Co.	17,802	279,013	14,167	292,681
Shamokin Div., N. C. RR.	23,030	683,282	25,066	721,683
Lykens Valley	*10,000	357,935	11,054	392,485
<b>Total</b>	<b>772,619</b>	<b>20,950,806</b>	<b>881,094</b>	<b>21,483,880</b>
Increase				
Decrease	108,475	533,074		

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

**Production for corresponding period:**  
 1880.....16,134,269 | 1882.....20,444,997  
 1881.....19,891,642 | 1883.....22,543,272

**Production Bituminous Coal for week ended September 19th, and year from January 1st:**  
 Tons of 2000 pounds, unless otherwise designated.

EASTERN AND NORTHERN SHIPMENTS.	1885.		1884.	
	Week.	Year.	Week.	Year.
Philadelphia & Erie RR.	30	21,141		
*Cumberland Region, Md.	50,072	1,957,660	66,821	2,018,901
*Barclay Region, Pa.				
Barclay RR.	4,629	170,323	6,862	216,106
*Broad Top Region, Pa.				
Huntington & Broad Top RR.	2,742	109,377	4,763	139,273
East Broad Top				
Clearfield Region, Pa.				
Snow Shoe	2,391	101,863	3,739	129,958
Karthauss (Keating)	2,139	87,478	2,056	33,888
Tyrone & Clearfield	48,078	2,067,769	65,924	2,233,513
Allegheny Region, Pa.				
Gallitzin & Mountaintain	11,906	372,213	9,554	273,975
<b>Total</b>	<b>130,987</b>	<b>4,887,724</b>	<b>159,719</b>	<b>5,045,664</b>
* Tons of 2240 lbs.				
WESTERN SHIPMENTS.				
Pittsburg Region, Pa.				
West Penn RR.	3,572	161,190	4,814	199,928
Southwest Penn. RR.	1,976	71,577	1,763	92,965
Pennsylvania RR.	3,927	149,027	3,468	197,258
Westmoreland Region, Pa.				
Pennsylvania RR.	30,375	848,809	25,995	932,319
Monongahela Region, Pa.				
Pennsylvania RR.	6,490	195,125	2,725	109,247
<b>Total</b>	<b>46,340</b>	<b>1,425,728</b>	<b>38,765</b>	<b>1,531,717</b>
<b>Grand total</b>	<b>177,327</b>	<b>6,313,452</b>	<b>198,484</b>	<b>6,577,381</b>

**Production of Coke on line of Pennsylvania RR. for week ended September 19th, and year from January 1st:**  
 Tons of 2000 pounds.

Kind of coal.	1885.		1884.	
	Week.	Year.	Week.	Year.
Allegheny Region.	4,287	129,733	2,712	96,466
West Penn. RR.	806	33,649		24,865
Southwest Penn. RR.	35,573	1,303,668	28,958	1,598,451
Penn. & W. Region.	3,964	165,667	3,712	138,289
Monongahela	1,754	67,623	997	54,815
Pittsburg Region.				136
Snow Shoe	954	12,309	325	16,769
<b>Total</b>	<b>47,338</b>	<b>1,712,649</b>	<b>36,704</b>	<b>1,929,791</b>

Chesapeake & Ohio Railroad Company's report of total output and distribution of coal and coke. Received from mines on line of Chesapeake & Ohio Railroad (including mines on Lexington Division) for the week ended September 7th and year from January 1st. Tons of 2000 pounds:

Kind of coal.	1885.		1884.	
	Week.	Year.	Week.	Year.
Canuel	818	697	16,328	14,161
Gas	4,930	6,685	241,893	213,168
Splint and block	3,306	2,503	104,769	60,940
New River, etc.	10,316	3,648	390,263	285,810
Coke	2,697	2,299	80,756	44,927
<b>Total</b>	<b>22,667</b>	<b>15,832</b>	<b>834,209</b>	<b>619,006</b>

**Anthracite.**

The better feeling in the trade has been fully maintained, and the demand seems to have increased some since our last. Although there have been no further advances of prices of a startling character, yet there has been a hardening up all around, and all are getting

better prices than prevailed two to three weeks ago. The following fairly represent selling prices: Stove, \$3.60@3.85; Chestnut, \$3@3.40; Egg, \$3.10@3.25; Broken, \$3.10@3.25.

Some shippers claim to be doing a good business at the higher range, while others admit that they are not, but ask the prices because they have sold all they care to sell at present at lower rates. The outlook favors a further moderate advance.

It looks as though stocks were being slightly reduced all around. The Reading Company, for instance, has reduced its stocks at Port Richmond 7000 tons since our last, and claims to have no coal on the market, and none nearer than five days. That company is now asking the following net prices f. o. b. here:

Broken	.....	\$3.25	Free burning.
Egg	.....	3.25	\$3.10
Stove	.....	3.85	3.85
Chestnut	.....	3.00	3.00

The Lehigh Valley Company, although not slaughtering its coal, does not appear to advance its prices with the spirit shown by the Delaware & Hudson Canal Company, for instance. The fact is, that the companies look upon the present condition of the trade as a mere fall spurt, and there is quite an inclination to "make hay while the sun shines." A prominent gentleman in the trade said to-day: "There is too much skimming for position in next year's game, to permit the remainder of this year's business to be very profitable."

There has been much talk of a general advance in prices on October 1st. The impression created was, that there would be a meeting of the several interests, at which it would be resolved to advance prices. So far as we can learn, there are no indications of such a movement, and if prices are put up still more, it will be the result of independent action of the shippers, and not a point action.

The retail dealers in this city and vicinity are exceedingly busy. In fact, they have not the carts necessary to do the business. This is due to householders having, like larger buyers, postponed their purchases to a greater extent than usual.

Freights are higher.

**Bituminous.**

There is a better feeling and more inquiry, although there is no improvement in prices. There is a great scarcity of cars on the Pennsylvania Railroad, while the Baltimore & Ohio road has an abundant supply. Harbor freight rates are up 3 cents, and Sound rates 10@15c.

There have been several cases of spontaneous combustion recently in piles of coal supplied by it, is said, new mines on the Beech Creek road. One fire was in an 8000-ton pile of the Boston & Providence road, a second in a pile of 1800 tons in Taunton, Mass., and a third in the Boston Ferry Company pile. This will tend to place these coals upon a lower scale than the older coals in the market, and may lower the market values of really deserving coals.

**Buffalo.** Sept. 24.

[From our Special Correspondent.]

There is a more buoyant feeling among our anthracite coal men than has been before exhibited this year. The prospect for a good fall and winter trade is quite cheering, and there do not seem to be any important stumbling-blocks in the way of its realization. Manufacturers continue to report improving business, and speak confidently and glowingly of the outlook. No changes have been made in quotations, nor are any in the near future talked of.

Anthracite coal is relatively cheap, compared with other commodities, and it only requires skillful and conservative management to obtain prices that will be satisfactory to producers and to consumers.

Bituminous coal is selling more freely, but no improvement in prices is made public. There are no particularly new incidents connected with business worth recording.

There are no changes in price, output, or trade for coke. There is a fair average demand.

Nothing was done at the meeting of the freight agents of the Western Railroad, held here yesterday, "to take measures to raise the coal tariff to the basis of the one in effect July 1st last," which was cut. The principal reason for no action was, that there was not a full representation.

The members of the Merchants' Exchange adopted unanimously, on Tuesday last, resolutions indorsing and congratulating Mr. John S. Hammond, the newly

appointed general freight agent of the New York, Lake Erie & Western Railroad. Mr. J. J. Albright, Jr., the well-known coal merchant of this city, has purchased four acres of land on Ferry street for \$66,800.

There is a scarcity of coal cars here for West-bound freight, especially on the Lake Shore and Nickel Plate roads. The authorities should have the evil remedied as soon as possible. Through some hitch relative to mileage charges, the Michigan Central, Grand Trunk, and Buffalo, New York & Philadelphia roads are also behind the times in affording a sufficient number of cars for their coal customers.

One of our dealers has sued the Butler Colliery Company for \$20,000 damages, because he has been ruled out of the Coal Exchange for cutting rates, and the said company has refused to fill his contract (made early in the season) for supplying him with coal, and none of the other companies will furnish him under the rules of the Association. Hence he can not fill his orders at the cut figures, and sues the company for breach of contract. The question raised is one of great importance to the trade, and the result will be looked for with much interest.

One of the strange things connected with freight carrying is, that a ton of coal can be taken from Buffalo to Duluth, distance say 1000 miles, for about one half the cost of transferring the same ton from the dock to the consumer's coal-bin, perhaps not half a mile away!

The condition of the lake freight trade continues very unsatisfactory to vessel owners. Lake Superior coal rates have been cut to 25 cents a ton, and there is no doubt that line propellers have taken coal to Chicago and Milwaukee at 40 cents. Vessels are already starting preparatory to going into winter quarters at Chicago, and it appears reasonable to suppose that the bulk of the carrying trade for the remainder of the season will be done by the railroad line propellers, which are not so ruinously affected by the low rates, because the stockholders are the sufferers, and who cares for them?

It will be seen from our statement of lake exports that business has been almost at a stand. The only activity manifested was at the chutes of the Delaware, Lackawanna & Western; this road bringing coal over its own tracks directly from the mines at a day's notice. The shipments of coal by lake from Buffalo from September 17th to 23d, both days inclusive, were 33,405 tons; 10,185 to Chicago, 6500 to Milwaukee, 5950 to Duluth, 673 to Saginaw, 2050 to Green Bay, 450 to Amherstberg, 217 to Goderich, 2640 to Toledo, 540 to Kincardine, 2600 to Superior City, 1150 to Detroit, and 450 to Bay City.

The freight engagements were at the following rates: 50@40c. to Chicago and Milwaukee; 40c. to Kincardine; 25c. to Superior City, Duluth, and Saginaw; 20c. to Bay City; 15c. to Toledo and Detroit; 50c. to Green Bay; and 45c. to Goderich; closing dull, with a charter to Chicago at 40c. Five of our largest propellers were ordered into winter quarters yesterday.

The coal shipments by canal for the past week were as follows: One boat-load to Syracuse, 45c. gross ton, free in and out; one boat-load to Schenectady, 87½c. net ton, captain to pay loading and unloading; one boat-load to Troy, 75c. gross ton, free in and out. The nominal asking rates were: To New York, \$1.25 per net ton, captain to pay loading and unloading; to Albany, 95c. per net ton, captain to pay loading and unloading.

The receipts of coal at Duluth for the week ended September 19th were 23,950 tons.

**Boston.** Sept. 23.

[From our Special Correspondent.]

There is a better feeling in the anthracite branch of Boston's coal trade. Trade has been more active, notwithstanding the advance in freights, which caused some to hold off who would otherwise have placed their orders. Should the weather be only ordinarily cool for the season, a large amount of coal will be wanted in the next six weeks to fill retail yards, and during this period, at least, prices will hold their own, and some expect to see the market re-established on the basis of \$3.85 for Stove at New York, within a short time, although this is hardly probable. Still, affairs are in good shape temporarily—not by reason of any thing the companies have done, but purely on account of the usual increased demand that always comes with the September frosts. The combination has no further influence, and



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and amount per share of last. It lists 130 dividend-paying mines and 118 non-dividend-paying mines.

G. Gold. S. Silver. L. Lead. C. Copper. \* Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,470,000. ‡ Non-assessable for three years. § The Deadwood was previously paid \$275,000 in eleven dividends, and the Terra \$75,000. ¶ Previous to the consolidation of the California and Consolidated Virginia in August, 1881, the California had paid \$31,320,000 in dividends, and the Consolidated Virginia \$42,931,000. \*\* Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends.



NEW YORK MINING STOCKS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Table with columns for 'NAME AND LOCATION OF COMPANY', 'HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE' (Sept. 19-25), 'SALES', and 'HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE' (Sept. 19-25), 'SALES'. Lists various mining companies like Alice Mon., Amie Con., Argenta, etc.

Dividend shares sold, 24,976. Non-dividend shares sold, 17,500.

it is very difficult to attempt to look ahead just now. Usually there is a dull streak in November, and should this occur, there is every reason to believe that prices will drop to the lowest point again.

There is no change to note in bituminous coal. Delivered prices range all the way from \$3@3.35, with f. o. b. prices nominally at \$2.25@2.35.

So many vessels have been discharging coal at this end of the line that freights are firmer. We look for a little easier rates as vessels are distributed.

The retailers are doing quite an active business. Prices remain steady. We quote: White ash, furnace and egg \$4.75@5.00

FINANCIAL.

Mining Stocks.

NEW YORK, Friday Evening, Sept. 25.

Business in the mining market this week was very dull, and there is nothing of special interest to report. In fact, the market was almost featureless, and what little was done we summarize in our report below.

The Comstock shares were but moderately dealt in at steady prices. Consolidated California & Virginia

was quiet, selling at \$1.65 cash and at \$1.50 60 days. Sierra Nevada records but one transaction, and sold at \$1.15.

The Leadville stocks ruled steady, and were fairly dealt in. Amie, under moderate sales, was weak, selling at from 6@4c.

The Bodie stocks were quiet and steady. Bodie sold at \$1.75 throughout. Bulwer was quiet and steady at from 35@33c.

Horn-Silver was dull and a little weak, selling at from \$2.20@2.05@2.15. Homestake sold at from \$17.75@17.50, under a small business.

Caledonia shows signs of weakness; it declined from \$2.90@2.35, and was but moderately dealt in. Central Arizona sold at 15c.

Coal Stocks.

The coal trade will hear with deep sorrow of the death of Mr. D. T. Moore, one of its most honored members. All who came in contact with him were at once charmed with his genial manner and frank nature.

& Reading Company in various capacities for over a quarter of a century. He was held in high personal esteem by all the officers of the company, from the highest to the lowest, during all the many changes of that corporation.

"None knew him but to love him, None named him but to praise."

B.

The stock speculation during the past week has been small, and prices have been merely a shade weak under adverse conditions.

In our issue of September 12th, we intimated that Lackawanna would declare a compromise dividend of 1 1/2 per cent.

The coal stocks were very strong on Saturday and Monday, on the announcement last week that the Delaware & Hudson Canal Company had advanced prices, and a general exaggeration of the improvement in the coal trade.

The dealings in Lackawanna aggregated for the week 242,655 shares at \$103 3/4@100 1/2, closing at \$102. Delaware & Hudson ranged between \$86 3/4 and \$83 1/2, and closed at \$84 1/2.

The August statement of the Pennsylvania Company is rather less unfavorable than had been anticipated. The decrease in net earnings on all the lines east of Pittsburg and Erie is \$502,495.

COAL STOCKS.

Table of Coal Stocks with columns for Name of Company, Par value of shares, Quotations of New York stocks (Sept. 19-25), and Sales from Sept. 19th to Sept. 25th inclusive.

\* Of the sales of this stock, 940E shares were in Philadelphia and 5520 in New York. Total sales, 298,073.

shows the following for the eight months of 1885, as compared with the same period of 1884 :

Summary table comparing 1885 and 1884: A decrease in gross earnings of \$2,979,225; A decrease in expenses of 653,280; A decrease in net earnings of \$2,325,945.

All lines west of Pittsburgh and Erie for the eight months of 1885 show a deficiency in meeting all liabilities of \$1,187,314, being an increased deficiency, as compared with the same period of 1884, of \$474,823.

Dividends.

Jackson Mining Company paid a dividend (No. 5) of ten cents a share, in San Francisco, September 12th.

Morning Star Consolidated Mining Company paid a dividend of twenty-five cents a share, amounting to \$25,000, in New York, September 19th. Total paid to date, \$550,000.

Moulton Mining Company has declared dividend No. 7, of seven and a half cents a share, amounting to \$30,000, payable at the office of Messrs. John M. Moore & Co., transfer-agents, No. 78 Broadway, New York, October 5th.

Ontario Silver Mining Company has declared its 111th dividend of fifty cents a share, for August, payable at the San Francisco office, or at the transfer-agency of Messrs. Lounsbury & Co., Mills Building, New York, on September 30th. Total dividends to date, \$6,725,000.

Plymouth Gold Mining Company has declared a dividend (No. 29) of fifty cents a share, being one per cent on the capital stock, payable at the company's office in New York or San Francisco, October 5th. Total to date, \$1,450,000.

ASSESSMENTS.

Table of Assessments with columns for Company, No., When levied, Delinquent in office, Day of sale, and Amount.

\* Assessment postponed until above date.

Meetings.

Meetings of the following companies will be held at the time mentioned : Little Chief Mining Company, at the office of the

company, No. 137 Broadway, New York, October 6th, at twelve o'clock M.

San Sebastian Gold Mining Company, at the office of the company, No. 12 Cortlandt street, New York, at two o'clock P.M., October 6th.

San Francisco Mining Stock Quotations. Daily Range of Prices for the Week.

Table of San Francisco Mining Stock Quotations with columns for Name of Company, Closing Quotations (Sept. 18-24), and various stock prices.

Pipe Line Certificates.

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

The fluctuations in the oil market for the past week have been within a small range, yet at times there has been considerable activity, and some good amounts have changed hands. The quotations have been from 99 1/2¢ to \$1.01 1/4, and close to-night at \$1, with some rumors of new wells, which for the moment have given the market a more feverish character. One of our firm, who is in the oil country this week, writes: "There is great activity in the oil regions, not merely in drilling in the old fields, in prospecting on their borders, or in hunting for 'wild-cats,' but in the lavish use of nitro-glycerine. This is an expensive stimulus, and, furthermore, the well must the sooner exhaust itself. As the whole field has been treated or will be at once to this process, its decadence will be hastened when the stimulus ceases. If no new large and prolific pool be discovered, the torpedoing of old wells and opening of new ones in the heart or on the outskirts of old fields, will not compensate for the decline that this winter will bring in the present producing wells." The statistical situation continues to grow stronger

day by day, and as we have before remarked, must make itself felt in advanced prices for crude petroleum. The following table gives the quotations and sales at the Consolidated Stock and Petroleum Exchange :

Table of Consolidated Stock and Petroleum Exchange with columns for Opening, Highest, Lowest, Closing, and Sales for Sept. 19-25.

FREIGHTS.

Coastwise Freights.

Per ton of 2240 lbs.

Representing the latest actual charters to September 25th :

Table of Coastwise Freights with columns for To, From Philadelphia, From Baltimore, and From New York shipping ports.

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

ROTHWELL'S GREAT MAP OF THE WYOMING VALLEY.

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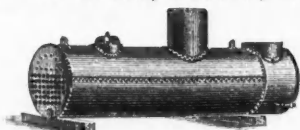
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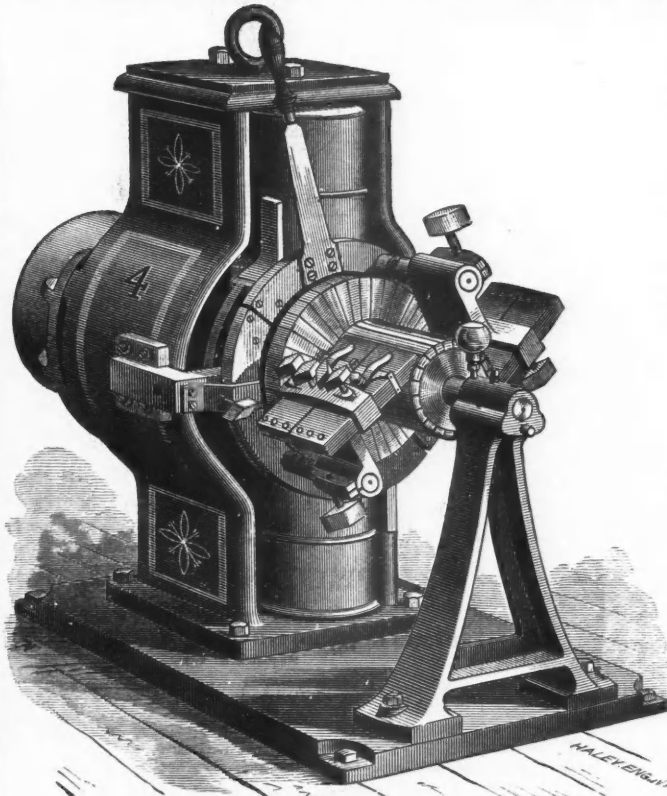
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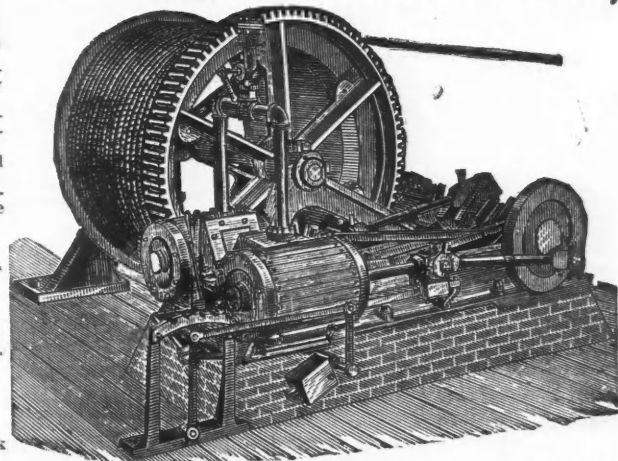
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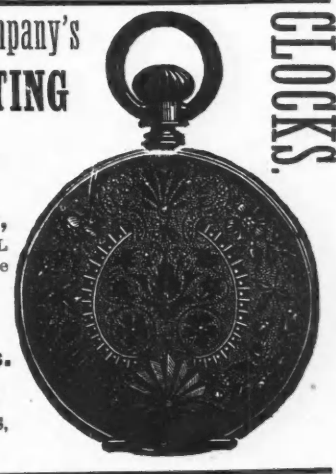
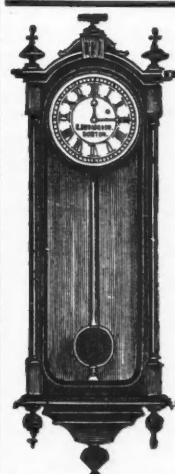
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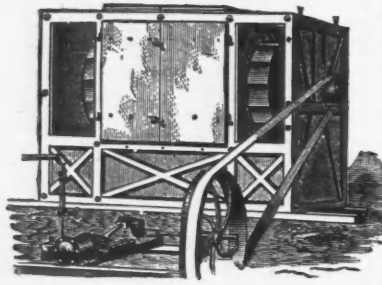
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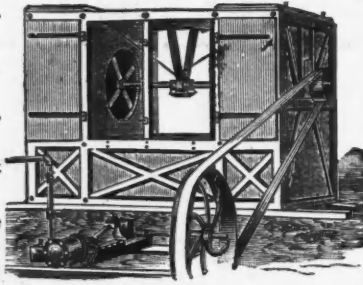
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