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CONTENTS.

Page.

The Adoption of Universal Bimetallism.....	259
Fluxing Ores.....	259
The True Representatives of the West.....	259
The Silver Question.....	259
Looting on the Comstock Lode.....	260
An Aluminum Coinage.....	260
The Proposed Bessemer Iron Ore Monopoly.....	260
New Publications.....	261
Books Received.....	261
The Great Gold Strike in Western Australia.....	T. A. Rickard 261
A Stray Piece of Brown Ore (Limonite).....	Wm. B. Phillips 261
Improved Methods of Treating Copper Ores.....	H. M. Beadle 262
The Pearce and Allen-O'Hara Roasting Furnaces.....	H. Van F. Furman 262
Gold Properties in Montana and the Decline of Silver.....	H. M. Beadle 262
The Turkey Creek Mining District.....	George H. Stone 262
* Mining at the Columbian Exposition.....	263
The British Iron Trade in 1893.....	S. H. Norths 264
* The Microstructure of Ingot Iron in Cast Ingots.....	A. Martens 265
Abstracts of Official Reports.....	266
A Notable Mining Lawsuit.....	H. M. Beadle 267
* The Perak Tin Mines.....	268
The Geological Survey of Great Britain.....	269
* Carborundum.....	Wm. P. Blake 270
A Transvaal Colliery.....	270
The Shale Works of Scotland.....	271
Recent Decisions Affecting the Mining Industry.....	271
Notes: Action of Sulphuric Acid on Platinum and Iridium Alloys, 264—Analysis of Aluminum, 264—Application of Natural Gas in Chemical Work, 264—Methods of Casting Steel Ingots, 267— Diamonds in Borneo, 269.	

* Illustrated.

MINING NEWS.	FOREIGN.	MARKETS:	San Francisco.
Alabama..... 272	Australia..... 276	METALS..... 278	Coal Stocks..... 284
Arizona..... 272	Br. Columbia..... 276	IRON..... 278	Colo. Springs..... 284
California..... 273	Cape Breton..... 276	New York..... 278	Baltimore..... 284
Colorado..... 273	Colombia..... 276	Buffalo..... 279	London..... 284
Idaho..... 273	Nova Scotia..... 276	Chicago..... 279	Paris..... 284
Indiana..... 273	Quebec..... 276	Philadelphia..... 279	Aspen..... 284
Kansas..... 273	Queensland..... 276	Pittsburg..... 279	St. Louis..... 284
Michigan..... 274	Russia..... 277	COAL:	Duluth..... 284
Minnesota..... 274		New York..... 279	Denver..... 284
Missouri..... 274		Boston..... 280	Helena..... 284
Montana..... 274		Buffalo..... 280	Philadelphia..... 284
Nevada..... 274		Chicago..... 280	Pittsburg..... 284
New Mexico..... 275		Pittsburg..... 280	
Pennsylvania..... 275			CHEMICALS AND
South Dakota..... 275			MINERALS..... 280
Utah..... 275			CURRENT PRICES:
Vermont..... 275			Chemicals..... 281
Washington..... 275			Minerals..... 281
Wisconsin..... 275			Rarer Metals..... 281
			ADVT. INDEX..... 19

ALAS! poor Reading! With the most valuable coal estate in the world, the Reading is always on the ragged edge of bankruptcy.

Is it any wonder that there is a pretty firmly rooted conviction abroad that its management has been bad, very bad, and that it needs overhauling? The finest coal property in the United States should at least be able to keep out of bankruptcy when others grow rich with much less desirable mines and under less advantageous conditions generally.

THE adoption of universal bimetalism, the only way in which a disastrous appreciation in the value of gold can be prevented, is constantly gaining advocates. It is in the interest of all, and most of all in that of Great Britain, for it would improve the credit of her countless debtors, enable them to pay what they owe her, and to buy more freely her manufactures. The adoption of universal bimetalism under the control of an International Monetary Clearing-House would be the longest step forward in enlightened statesmanship, in civilization, that the world has seen in a century; it would bring assured prosperity to every country and to Great Britain an industrial activity such as she has never experienced.

THE disastrous cyclone which swept up the Atlantic coast from the West Indies ten days ago causing great damage everywhere in its path, wrecked completely the phosphate dredging plants of the Coosaw River mining companies of South Carolina, and, of course, it has cut off thereby the production of phosphate rock from that source. This will cause, therefore, a restriction in output of about 10,000 tons per month until operations are resumed again on the same scale as heretofore, which will not be long, since many of the dredges merely sank and can easily be raised again. In the meanwhile we cannot see that this disaster will have any important effect on the phosphate market, which has been for a long time in a condition of despair, for whatever deficiency in supply this may occasion can be met readily and with pleasure by the Florida mines.

ORES rich in lead are often referred to as "fluxing ores," which the silver-lead smelter must have for admixture in his furnace-charges. The term is erroneous, for lead is not a flux, the part which it plays in the furnace being to collect the precious metals. There must be a sufficient proportion of lead in the charge, say 12 per cent., else there will be increased losses of silver in the slag; hence the demand for ores of high grade in lead by the smelters, who need them in order to mix with the silicious, or dry, ores. Lime and iron which are used in the furnace charges to combine with the silica of the ores in making an easily fusible slag are fluxes, but that term cannot properly be applied to lead ores unless they are basic in character, i. e., containing more iron, manganese or lime than silica, in which case the basic excess is fluxing.

SOME of those who claim to represent the West may be calamity howlers and prophets of evil, but they do not voice the sentiments of the population of the mining regions of the Rocky Mountains.

The sturdy self-reliance and indomitable pluck of the men who built up that empire, which we fitly call the Great West, will not desert them in their hour of trial. That an industry apparently permanent and carried on under conditions established by law should be threatened with destruction in the twinkling of an eye is a hardship, is a cruel thing, only too strongly evidencing the uncertain conditions of our economic civilization. It is no wonder that hard things are said and bitter things are thought. The wheels of commerce have been stopped and industry is paralyzed for the moment. Nevertheless, the men who built up Denver and San Francisco, who conquered the wilderness and reclaimed the desert, are not the kind that lie down and howl. Already the first feeling of despair at the suddenness of calamity has passed away, indignation coupled with a strong desire for retaliation has supervened with some, while a willingness to wait and "take their medicine" characterizes others. The Western miner will always come out right—he never gives up.

THE effect of the enormous majority in the House for the repeal of the Silver Purchase Act was felt immediately in an improvement in business throughout the country. Every one then assumed that the Senate would act promptly, in accordance with the expressed wish of two-thirds of our people, and pass the repeal. It is to be hoped it will do so, and not spend precious time in such useless talk as that of Senators PEPPER and STEWART. The good effect of repeal extended to European investors. Large capitalists in London who had suspended negotiations for the purchase of several million dollars of bonds, when the question of this country getting down onto the silver basis frightened so many and drove so much money from us, write us from London, under date of 30th August, that "the vote in the House of Representatives on the silver bill has made an important change here in American matters and we are now ready to take up the negotiation."

Others wrote just before the vote: "There is plenty of money here ready to go into American securities just as soon as you settle the silver question."

Any great delay on the part of the Senate may chill this rising confidence and set us back again.

THERE has been talk in Washington and in the daily press lately about relieving the bankrupt condition of the Treasury by "coining the seigniorage," which phrase is mysterious to many people. What is meant by it is this: The silver purchased since July 14, 1890, under the Sherman Act has cost an average of 93 cents per ounce. Accordingly, each 1,000 ounces of silver bought at this rate has cost \$930. Now, if these ounces had been coined under the terms of the Bland-Allison Act of 1878 they would have yielded 1,293 silver dollars, or \$363 more than the Treasury notes issued on the same amount of silver purchased under the Sherman Act. The total amount of the latter is 163,047,000 ounces, on which there would be a nominal profit of about \$58,000,000 by "coining the seigniorage." In other words, the Sherman Act would be declared to have been only play, and the 163,047,000 ounces of silver bought since July 14, 1890, would be coined according to the Bland-Allison Act, which ceased to be a law on that date. This would be like the gambling of a child, who declares for keeps when he wins and only for fun when he loses. In a man, that would be dishonest and would not be permitted. The position of the Government would be exactly analogous. It has the power to create fiat money, but it would lose its credit in doing so; and if it proposes to do it, then it were better to issue fiat money openly and without pretense. Nothing of the kind however should be dreamed of.

ABOUT two months ago, just after the great drop in the price of silver, when the mines all over the West were closing down (or threatening to do so), it was reported that the Comstock companies would continue operations in any event, "nearly half the value of their ore being in gold, and the miners having voluntarily agreed to a reduction in wages from \$4 to \$3 per day." Now it turns out that the only truth in these reports was the determination of the companies to keep at work. A very mild attempt to readjust wages was made, which was of course chiefly for effect among the shareholders, but the miners' union declined to listen to any such proposition, and the whole scheme was thereupon promptly dropped. The miners said very coolly that they did not mean to have their pay cut down so long as the superintendents, clerks, foremen and other (for the most part unnecessary) officials continued to draw exorbitant salaries, which there had been no talk of reducing: if the stockholders could afford to pay these men more than their services were worth, they said, of course the miners also should have high wages; in other words they did not propose to give up their share of the loot of the stockholders under any such pretext as the decline in the value of silver and the less profit in mining. So the directors and managers dropped the subject without further argument; the superintendents continue to draw salaries ranging from \$5,000 to \$15,000 per annum. There are all kinds of useless officers and clerks, and the extortionate prices for wood, water, milling, etc., go on, while the miners still receive their \$4 per day wages. Really, the decline in the value of silver has nothing to do with the output of the metal from the Comstock Lode, though it cuts down the income of the mill-ring. The money for producing the silver is drawn from the gudgeons and gamblers in San Francisco, and so long as there are many of these there is no reason why the mines should not keep working as usual; and the head of the mill-ring, Senator John P. Jones, and the mill-ring's attorney, Senator Stewart, will keep on declaiming voluminously and virtuously in Washington on the rights of the poor and the robberies of the goldbugs.

AN ALUMINUM COINAGE.

The Populist representatives of Kansas in the Congress have had many wonderful outgivings, since they first made their appearance in the Capitol. There was, for instance, the guileless proposal of the Hon. Mr. SIMPSON a few years ago that United States notes should be issued on the gold and silver stored in the Rocky Mountains, without going to the trouble of extracting it; the query as to how the amount of the precious metals hidden in the rock-ribbed mountains was to be determined was answered by the off-hand reply that the geologists, engineers and those fellows could easily tell that! But now comes Senator PEPPER with a more remarkable scheme, under the guise of a bill to advance the arts, sciences and knowledge in general. It consists of nineteen sections, providing among other things for a department of education, the establishment of a college (to cost \$20,000,000) in the District of Columbia, and the appropriation of \$800,000,000 as an endowment for the said college.

It would be hard to secure such a large amount of money if the appropriation were made, one would suppose, in view of the fact that the surplus in the treasury has already dwindled away, and outgo now exceeds income, but Senator PEPPER has arranged for this important matter in the fourteenth section of his bill, which provides for the purchase of aluminum for coinage of currency to the amount required—i. e., \$800,000,000. The coins are to be 1, 5, 10, 25, and 50 cents, and 1, 5, 10, 20 (and multiples of 20) dollars; they are to be legal tender for all debts—public and private.

The first thought of all reasonable people must be of the utter absurdity of this preposterous scheme, which might be taken for a huge joke, were not the United States Senate a dignified body. Yet the only differ-

ence between so much of this proposal as relates to a system of currency and those of the free coinage party is one of degree. The latter wants the Government to buy silver at about 57 cents, the present value of the bullion in a dollar, and stamp it one dollar. Senator PEPPER, on the other hand, would buy aluminum, which costs 50 or 60 cents per pound, and issue it at some fictitious value.

With that part of the free-coinage party known as the debtor class one of these plans would be quite as satisfactory as the other; they profess no sentimental attachment for silver, and aluminum, or nickel, or copper, or paper would meet their wishes fully as well. But how will Messrs. JONES and STEWART, and TELLER and WOLCOTT like the aluminum proposal? What will their constituents, who have silver and no aluminum to sell, say about it? Then suppose the owners of the bauxite banks in Georgia, Alabama and Arkansas and the aluminum smelters of Pittsburgh and Niagara enter the field, there might be war between the silver party and the aluminum party, and we would have trimetalists and "lightning bugs," which we suppose would be the official title of the aluminum cranks.

The silver men had better call down the Pops and confine them to their original scheme of national securities based on pumpkins—we know what they are.

THE PROPOSED BESSEMER IRON ORE MONOPOLY.

The times are scarcely propitious, one might think, for the organization of great bubble "trusts" or combinations having for their object the monopolizing of commodities. These trusts have indeed been a prominent cause of the financial panic through which we have just passed. Every one knows the disastrous collapse of the inflated stocks of such "trusts" or combinations as those for lead, whisky, cordage, breweries, electrical appliances, and the many disasters that have attended the efforts to make a close monopoly in the anthracite trade, and which has been illustrated in the pyrotechnical career of the Reading.

The great inciter to the formation of such trusts is the remarkably successful career of the Standard Oil trust, which is now, indeed, one of the great money powers behind some of later and less successful efforts at monopoly.

Not only had the Standard Oil Company very exceptional ability in control of its plans and policy, but the conditions of oil production and marketing were also favorable to monopoly. In iron ore the case is different. It is not possible to control all the iron ore mines, nor yet the railroads bringing the ores to market, though it might be to monopolize the steel works which use the bessemer metal.

Mr. MERRITT, one of the leaders in the scheme, is reported to have repeated the old story of "the substantial savings to be attained by the combination," but he figures out a profit of \$2.95 per ton on ore that he counts will be sold at \$4.50 per ton in Cleveland, as against about \$3.75 this year, when every department of the ore trade has been unprofitable. Some of the railroads, it is true, charge extortionate rates of freight, but if the combination should figure down freights and royalties, which are also extravagant, to reasonable rates, the cost might be brought down to about the following figures:

Mining.....	\$1.30 to \$1.15
Royalties.....	.25 " .50
Freights, rail and water.....	1.50 " 1.20
Insurance, commission, etc.....	.15 " .15
	\$3.20 to \$3.00

But besides the well known fact that these great monopolies never work as cheaply as private operators; there is little probability of getting either of these items down to these figures.

Mr. MERRITT is reported to have said further that:

"The trustees have figured out a profit of \$2.95 per ton. The trust could defy any corporation, domestic or foreign, because even if the tariff of 75 cents per ton should be removed, it could easily compete with foreign miners."
"The trust, if it chose, might lower prices to such a level as to prostrate all the other iron mines in the country. There was no such intention, but on the other hand, the trust would proceed in the hope that prices might be maintained at \$4.50, thus enabling all miners to carry on their business at a profit."

It is always well to have on record the exuberant opinions and plans of these promoters; the probability is that the ore business in the future will be doing extremely well, as an average over a series of years, when it nets the mineowner 30 cents a ton. The scheme as at present outlined looks more like making profits by exploiting the stock than the ore markets.

The combination can never control any large proportion of the mines. The "woods are full of them" in Minnesota and Michigan, to say nothing of New York, New Jersey, Virginia, North Carolina, Tennessee, Alabama, etc. It is true that only some of the mines yield bessemer ore, but the basic process, using non-bessemer ores, is competing very closely with the bessemer product in the market. Canada, Cuba, Central and South America contain abundant supplies of high grade bessemer ores that are not and will not be controlled by this Standard Ore Combination. Moreover, the prices named as the purchase prices of the mines (as quoted in our mining news columns and the press dispatches) are so extravagant that the end of this stock deal must be perfectly apparent to all who have witnessed the recent pricking of similar bubbles. No doubt one effect of this consolidation will be the greater certainty of the removal of the duty

on iron ore—and in this its promoters may unwittingly and unwillingly reduce the cost of bessemer iron in the East and South. The plan as published bears none of the familiar earmarks of the cunning hand that has built up the great Standard Oil Trust.

NEW PUBLICATIONS

THE ORE DEPOSITS OF THE UNITED STATES. By James F. Kemp, A. B. E. M., Professor of Geology in the School of Mines, Columbia College. 1893. New York: The Scientific Publishing Company. Pages, 256. Illustrated. Price, \$4.

This volume fills a long-felt want in our only too scanty literature on economic geology. In 1854 Prof. J. D. Whitney's "Metallic Wealth of the United States" was hailed with delight by all interested in the subject of our American ore deposits, not only by the geologist, but by the miner and by the capitalists interested in mining ventures. It was the first attempt at a comprehensive and scientific treatment of American ore deposits, and was doubtless the stimulating cause of many more recent investigations in this much-neglected branch of geology. The volume filled a most valuable place in geologic literature and has become a classic work. Since the time of its publication a number of works on special mining districts in this country have been issued, especially by the National and State Geological Surveys, and some of them are of great interest and value; but no comprehensive work devoted exclusively to American ore deposits has appeared since the publication of Prof. Whitney's volume. The fact is all the more remarkable when we consider that some of our greatest mining regions have been developed since he wrote, and that the value of our mining products has increased from a comparatively small amount at that time to the immense sum of \$679,597,879* in 1892. During this period, however, the European geologists have been much more active in this subject. The work of Von Cotta, Von Groddeck, Grimm, Loettner, Sorlo, Posepny, Phillips, Fuchs, De Launay and many others have made us much more familiar with the foreign ore deposits than with our own. Many foreign writers, especially Phillips, in his volume on ore deposits, have given descriptions of American deposits; but these accounts have been mostly derived, not from personal observation, but from the very scanty, fragmental and not always reliable publications on special deposits that from time to time appear in our periodicals.

It is with great pleasure, therefore, that we note the appearance of Prof. Kemp's volume devoted exclusively to American ore deposits. This work is divided into two parts. Part I. treats of General Geological Facts and Principles; the Formation of Cavities in Rocks; the Minerals important as Ores; the Gangue Minerals, and the sources whence both are derived; the Filling of Mineral Veins; Certain Structural Features of Mineral Veins; the Classification of Ore Deposits. Part II. treats of the deposits of the various ores found in this country, including Iron, Copper, Lead, Zinc, Silver, Gold, Aluminum, Antimony, Arsenic, Bismuth, Chromium, Manganese, Mercury, Nickel, Cobalt, Platinum, Tin, etc. The volume closes with a few general remarks on the distribution of different kinds of ore deposits in America and with addenda relating to various special subjects. Numerous illustrations are given which add greatly to the clearness of the discussion.

The author states in the preface that the volume has a double object, one as a text book, the other to stimulate investigation. In both these objects the volume should be very successful. It contains a vast amount of material concisely and conveniently arranged. It necessarily pre-supposes a general knowledge of geology on the part of the reader, and it gives, therefore, only a brief sketch of those principles of geology which are most important in the discussion that is to follow. It also gives a general sketch of the topography and geology of the United States; but it does not take up the innumerable points in American geology yet in dispute, for such discussions would be out of place in a volume of this kind. The nature and origin of various ore deposits are more fully discussed. The chapter on the classification of ore deposits treats very carefully various classifications that have been offered by different writers, and then presents a new one by the author himself, which is based largely on the origin of the deposits. The classification of ore deposits is a difficult subject and may be treated in several different ways. A classification based on origin is undoubtedly the most reasonable one, but for various practical reasons the other features of ore deposits, such as form and contents, cannot be entirely ignored, and these are very properly recognized as subordinate elements in the classification suggested by Prof. Kemp.

In the discussion of the various ore deposits of this country, Prof. Kemp makes mention of every known deposit or group of deposits of importance, and in many cases gives fuller descriptions of the more noted mining districts. The various deposits are treated sometimes under the headings of the different districts, sometimes under the headings of the different ores of the metal discussed. The facts presented are partly derived from the personal observations of the author; partly from the published descriptions of other writers. The author's own work is excellent, as is also much of that which he quotes, and if certain parts of some of the quoted descriptions are open to a difference in opinion, it must be remembered that the author gives them only for what they are worth and generally with his own criticism. Many of the subjects discussed are matters on which there is much dispute among geologists, but the author has mentioned all the reasonable views that have been presented and has discussed them as fully as circumstances would allow. His discussions are very impartial, and he has in every case acknowledged the allowable differences in opinion.

In a work of this kind, comprising the description of an almost infinite number of deposits and treating of an immense stretch of territory, the descriptions and discussions must necessarily be brief in order to restrict the volume to practical dimensions. It is also often difficult to tell where to expand and where to restrict, but whatever

course is followed the volume must show signs of a brevity on any given subject which is obviously necessary. This volume, however, is not claimed to give a full discussion of all the deposits mentioned, and for those who wish to look more fully into any matter, a large number of references to the best authorities are given. These various bibliographies of more important publications, given in the footnotes and at the beginning of some of the chapters, are an exceedingly important and valuable feature of the book.

The volume is accompanied by an excellent index and table of contents, which add greatly to the utility and value of the book.

The dedication of the volume to Prof. John Strong Newberry, Prof. Kemp's predecessor in the chair of geology at the School of Mines, Columbia College, is a graceful tribute to a man who did much to advance of the cause of economic geology, and whose name is inseparably connected with the development of American geology in general.

In conclusion, it may be said that the volume reflects great credit on the author. It fills a long-felt want, and will be found to be of the greatest use to all interested in the subject of ore deposits and in economic geology in general.

BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in another page of the Journal.

The Coal Trade. By Frederick E. Seward, New York. 1893. Pages 121.

Special Report on the Bendigo Gold Field. By E. J. Dunn, F. G. S. Published by the Government, Victoria, Australia, 1893. Pages, 20, with illustrations and map.

Annual Report of the Secretary of Mines, of Victoria, for the year 1892. Published by the Government, Melbourne, Victoria, Australia. 1893. Pages, 72. Illustrated.

Victorian Year Book, 1892. Vols. 1 and 2. By Henry Heslyn Hayter, C. M. G. Published by the Government, Melbourne, Victoria, Australia, 1893. Pages, 1,130. With map.

Seventh Annual Report of the Commissioner of Labor. Cost of Production: The Textiles and Glass. Vol. II. 1891. Washington, D. C.: Government Printing Office. Pages 1,265.

The Coal and Metal Miners' Pocketbook of Principles, Rules, Formulas and Tables. 1893. Scranton, Pa.: The Colliery Engineer Company. Pages 365. Illustrated. Price \$2.75.

Experiment Station Record. Vol. IV., No. 10. United States Department of Agriculture. 1893. Washington, D. C.: Published by Authority of the Secretary of the Treasury. Pamphlet; pages 61.

The Ore Deposits of the United States. By James F. Kemp, A. B. E. M., Professor of Geology in the School of Mines, Columbia College. 1893. New York: The Scientific Publishing Company. Pages, 256. Illustrated. Price, \$4.

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.

The Great Gold Strike in Western Australia.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Inclosed find a newspaper cutting (see mining news on another page) which gives the latest reliable information regarding the Western Australian goldfield described by Dr. Peters in your issue of August 26th. As was to have been expected, the very rich discovery mentioned by Dr. Peters is only a bunch. As is usual in these matters, one hears a great deal of the extremely rich pocket, but we shall hear very little indeed of the unsuccessful search for similar pockets. Those who have lived in Australia have gotten accustomed to these fairylike tales of fabulously rich goldfields found in the deserts of Western Australia. It is a region, very rich doubtless, but most inhospitable. The difficulties to be overcome in the carrying out of mining operations are enormous.

DENVER, Colo., Sept. 2.

T. A. RICKARD.

A "Stray" Piece of Brown Ore (Limonite).

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: In one of the levels of the Fossil slope on Red Mountain, near Birmingham, Ala., there was recently found a "pot" of limonite imbedded in the lime-ore. It occurred at a point of the slope about 600 ft. from the mouth and about 150 ft. below the surface. During a recent visit to the locality I secured a piece of the limonite and was told of the curious "find" by Mr. Terrell, the superintendent, who came upon it himself. How this pot of brown ore happened to be inclosed in the lime-ore is an interesting question. The lime-ore is some 12 ft. thick, and very solid. Its average composition is: Iron, 40%; silica, 10%; lime, 13%. At the point where the pot was found there was no cavity or fissure, the limonite being firmly imbedded in the other ore. The pot was full of what was said to be water, was of an ochraceous yellow externally and presented within the usual black, shiny appearance of botryoidal limonite. The nearest known deposit of brown ore is 20 miles away on the other side of the valley, and is not connected directly with the red ore. On referring to an old note book I find that at the Champion brown ore mines in Murphree's Valley, 40 miles from Fossil, there is a thin seam of red ore lying in close proximity to two thin seams of brown ore, showing that the brown and the red ore do occasionally occur in the same vertical section and within a few inches of each other. There is nothing especially significant in this, but the inclosure of a "pot" of brown ore in a solid 12-ft. seam of lime-ore is, to say the least, extremely puzzling. If any of the readers of the "Engineering and Mining Journal" care to attempt an explanation the way is open.

BIRMINGHAM, Ala.

WM. B. PHILLIPS.

* The Mineral Industry, Vol. I. for 1892.

Improved Methods of Treating Copper Ores.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: An important improvement in calcining furnaces has been made by Mr. C. M. Allen, the superintendent of the reduction works of the Butte & Boston company, at Butte, Mont. Mr. Allen's improved O'Harra furnaces, built for the Montana Ore Purchasing Company, are calcining from 40 to 60 tons of ore in 24 hours, according to the amount of sulphur the ores contain, eliminating all the sulphur except about 5%, thus making the average cost of calcining a ton of ore 65 cents. The furnace, properly put up, will last a lifetime.

In Butte the copper ores are sulphurets, and a large part of the mineral occurs in bunches of considerable size. As the rich mineral is very much softer than the rock in which it is contained, to pulverize the ore causes the richest portions to be reduced to a powder which is difficult to save on jigs or vanners. Mr. Allen crushes the ore so as to pass through a 2½-inch screen, and then conducts it to his coarse jig, which takes out all the pieces of ore, and the tailings from this jig are taken to rolls or stamps, where they are pulverized, and the smaller pieces of ore separated from the gangue by other jigs and vanners. Two of these Allen jigs are now in successful operation in the Butte & Boston concentrator, and others will soon be put in.

The ore that is separated from the quartz or other rock before it goes to the stamps or rolls can be smelted very much better than if it had been crushed finer. The cost of pulverizing is saved by the coarse jig, and the fines are saved more closely.

The machinery here referred to can be placed in any of the concentrators now in use, as the jig takes but little space and does not alter the present methods of treatment, but is simply an addition. In a few words, the idea is, as soon as a piece of mineral has been broken from the rock, to remove it, no matter what the size. Any further crushing or sizing will only result in a corresponding loss of the mineral and increased cost.

This method would not be applicable to ores in which the mineral is finely disseminated through the gangue.

BUTTE, MONT., 1893.

H. M. BEADLE.

The Pearce and Allen-O'Harra Roasting Furnaces.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I have read with interest Mr. Ballinger's letter in the "Journal" of July 22d on the "Pearce and Allen-O'Harra Roasting Furnaces," and also Dr. Pearce's reply to the same in the "Journal" of August 5th. While I have had no experience with the Allen-O'Harra furnace I am familiar with the Brown-O'Harra and the Pearce turret furnaces. Mr. Ballinger states the cost of calcining at Butte in the Allen-O'Harra to be 62 cents per ton of ore. This is remarkable, and, I believe, is the cheapest roasting that has ever been accomplished upon the basis of prices for fuel and labor as at Butte. Notwithstanding that the cost of roasting at Denver is only about 60% of what it is at Butte, using Mr. Ballinger's statement of prices for fuel, labor, etc., at Butte with the prices which prevail at Denver as a basis for comparison, such a result has never been attained at Denver with the Brown-O'Harra furnaces in operation there. Mr. Ballinger's figure of 62 cents per ton is only about 60% of the actual cost of roasting in the Brown-O'Harra at the Argo Works, Denver. At another large Denver establishment where the Brown-O'Harra has been in operation for more than a year past the cost of roasting considerably exceeds \$1 per ton. At the same works with the Brown-O'Harra provided with a fusion furnace attachment for fusing the roasted ore prior to smelting in the blast furnace, the writer is informed that the results are not greatly superior to what is accomplished in the long-hearth reverberatory furnace with a fuse box attachment.

At Denver one of the greatest sources of annoyance and expense in the use of the Brown-O'Harra furnaces is the necessity of frequent stoppages for repairs. That this is a source of considerable expense will be readily understood when one considers the immense amount of brickwork which has to be reheated every time the furnace is started up after a shutdown, and the resulting damage to the furnace. These frequent stoppages require also that a supply of roasted ore should be carried on hand or that extra furnaces should be provided to take the place of those out of operation from time to time. This is another item of expense which should properly be charged up against the roasted ore. These items of expense do not appear to have been taken into consideration by Mr. Ballinger, nor do I believe that his allowance of \$1 for repairs is sufficient. While no fault can be found with the completeness with which the Brown-O'Harra roasts, the same is true of the Pearce furnace.

For roasting preparatory to matte fusion the writer believes the Pearce furnace to be superior to all others. For the roasting of lead ores preparatory to smelting in the blast furnace the Pearce furnace presents some of the disadvantages common to all mechanical furnaces, the ore being discharged from the furnace in a finely divided condition, and requiring fusion before entering the blast furnace. The experiment of attaching a fusing furnace to the Brown-O'Harra has been tried, but only with a fair degree of success. A Pearce furnace with fuse-box attachment is now in process of construction.

For chloridizing roasting and the roasting of gold ores preparatory to barrel chlorination the Pearce furnace would appear to present many advantages, and it certainly is worthy of investigation by our metallurgists.

DENVER, Colo., August 11, 1893.

H. VAN F. FURMAN.

Gold Properties in Montana and the Decline of Silver.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Our people have recovered from the bad effects of the first news of the decline of silver on their spirits. They are determined to make a fight for the white metal. They don't believe that the present condition will continue. The gold properties in this vicinity are doing well. The Bald Butte company, some four miles south of Marysville, is adding 20 stamps to its mill, doubling its capacity. The explorations that have been going on in this mine prove that it contains large bodies of ore of good grade.

and this fact caused the company to double the capacity of the mill. The Penobscot, operated by the Longmaid Brothers, is proving that they were not wrong when they reopened this old property. Some bodies of good ore have been found, and their extent is being determined. The owners are getting ready to sink the present working shaft to the 400, but will have to pump the water out before they can sink far below the 300. They are putting in concentrators to catch some of the value that has been going off in the tailings, and have increased the plate surface, and put in a Robinson riffle, to save the gold and quicksilver that has been going off in the tailings. They will soon be able to make a showing in the saving of the metals in the ore equal to the best mill in the country.

The Whitlatch Union & McIntyre Company is working 30 men in its property at Unionville, four miles south of Helena. The development shows large ore bodies rich in gold in sight, and the next problem they will have to solve will be the erection of better facilities for reducing ore. Now they have one 5-ft. Huntington mill, but it is insufficient to crush the ore now in sight. This mine promises to be equal to the old mine after which it was named. The Mac, near the last-mentioned mine, is showing up well, and now has two Crawford mills at work on the ore. Seven tons of ore are being treated in each mill in 24 hours, and the machinery has been so perfected that the ore is ground to pass through a 100-mesh screen. Over 90% of the gold is said to be saved. It requires about 8 H. P. to run one of the mills, though if only one were operated more power would be required for the best work.

The Piegan company is now operating its mine near Gloster. A rich body of ore has been encountered, 50 tons of which milled a fraction less than 2 oz. to the ton, besides about 4 oz. of silver.

John Winscott's 10-stamp mill, a few miles southeast of Helena, is running regularly. The Drumlunnon mine, owned by the Montana company, at Marysville, is running 40 stamps in the 60-stamp mill and 30 stamps in the 50-stamp mill, on its own ore. It is doing some custom work occasionally on the other stamps. The St. Louis company has begun other suits against the Montana company, and laid injunctions on its working certain ground. It would seem that the injunctions were laid merely to harass the company, for it has ample property to pay any judgment the St. Louis company can obtain against it. The effect of these judicial proceedings may be to close this mine. The fire and flood of last year greatly damaged it, and the suits it has won in the courts have caused it to make great outlays. Now, to harass it further by preventing it from working certain ground has further injured it. The Empire company mill is being run now upon Bell Boy ore, but it is believed that the ore in this property is about exhausted. How long it may hold out is not known at present.

HELENA, MONTANA.

H. M. BEADLE.

The Turkey Creek Mining District, El Paso County, Colo.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Lately there has been quite a rush of prospectors into the region south and southeast of Pike's Peak, and they have organized a new mining district, including the upper valleys of Turkey and Red creeks, and some of the adjacent territory. Most of the locations are in the area of Archaean rocks, the metamorphic granite of Hayden's Atlas. A careful search of the stream gravels of the region failed to reveal a single fragment of volcanic rock or intrusive porphyry. The Pinkeye lode, as it is called, seems to attract considerable attention. It is a narrow strip of pink or reddish rock that outcrops at intervals and has been located for about 12 miles. Its direction is nearly north and south. It is bordered on both sides by granite gneiss, and other Archaean rocks. To the unassisted eye, this so-called lode often presents the compact appearance of an igneous rock, but examined in thin section under the microscope it is plainly seen to be a fine grained sandstone. The grains are of quartz. They are nearly all well rounded, and their interstices are filled with an iron-rusty cement. In places the grains are larger, some 1-16 of an inch in diameter, and easily recognizable by the eye.

Several locations have been made along narrow outcrops of a fine grain black rock, also inclosed between walls of granite. These ledges are nearly parallel with the Pinkeye lode, and in the same region. Both the pink and black rocks contain some disseminated pyrites, magnetite and hematite. In places the black ledges have parallel walls and appear like igneous dikes. The rock proves to be in part a fine grained sand rock, a part is an hornblende rock having a granite crystallization, and a part is not yet determined. The granite at its contact with both the pink and black lodes shows little if any decomposition. Just outside the border of the Archaean area quite a number of locations have been made in the upturned Silurian and carboniferous rocks. They present nearly the same appearance and character as those found near the mouth of Williams' Canon, Manitou.

I inspected one prospect on the Pinkeye lode where a crosscut has revealed five nearly parallel streaks of black clayey material. Each is 1 to 4 in. wide, and from a few inches up to a foot or two apart. The pink rock next the clay is somewhat slickened, and thus it appears there were here a series of small slips. In places there is a little calcite in the clay, and thin seams both of the pink and black rocks. I have heard of no fissure vein of quartz in the district. A piece of quartz carrying grains of malachite has been brought in; it contains here and there grains of red feldspar like that of the red granite of this region, hence it is evidently a segregation formed in the granite. Prospecting and exploring are only begun, and the practical value of the camp remains to be ascertained.

As one goes over the Pike's Peak region he will find that almost every mass of sandstone inclosed between walls of granite has at some time been located and more or less explored. Thus, near Green Mountain Falls, up the Ute Pass, shafts up to 100 ft. deep have been sunk at various times in rocks of this kind or at their contact with the granite. These remarks apply to the Archaean rocks.

COLORADO SPRINGS, Colo., August 16, 1893.

GEORGE H. STONE.

MINING AT THE COLUMBIAN EXPOSITION.

Specially Reported for the Engineering and Mining Journal.

THE WASHINGTON MINERAL EXHIBIT.

Washington's mineral exhibit, of which we herewith present a picture, is situated in the southeast section of the Mines Building. The pavilion is built of Washington brown stone, and architecturally it is as attractive as any in the building. For a centerpiece a star-shaped stand has been erected, and ores from different parts of the State are piled high on it. Attractive cases displaying the State's mineral resources line the side of the pavilion, and massive lumps of gold, silver and iron ores are arranged along the floor. In one case gold nuggets valued at \$3,000, and owned by the State, are displayed. They were taken from the Sanck Creek placer workings near Ellensburg, a tributary of the Columbia River. Mr. Leonard Sivyver, M. E., is in charge of the exhibit.

Gold was first discovered in Washington during the year 1851, when it was found on Queen Charlotte's Island. In fact, this was the first discovery of mineral of any kind within the State. During 1855 gold was also discovered in the rivers of Eastern Washington, near the 49th parallel, and in 1860 it was also found along the Salmon River. This last discovery created a wonderful stampede to the new diggings, and it is said that the stampede was as remarkable as the one

County. Mining was first done here late in the sixties; and about the year 1870 a track was laid from the mine to Lake Washington, near what is now called Murphy's Landing. Here the coal was loaded on scows and taken through the slough at the southern end of the lake into Black River, thence along the Duwamish river into Seattle. Some time elapsed, then the scows, carrying the mine cars, were towed to the northwest end of the lake, and transferred along the portage to other scows on Lake Union; arriving at the southern end of the lake, the coal cars were run over a track to the terminus at Pike street, and dumped into a bunker, from which the vessels were loaded. This mode of transportation was continued until the completion of the narrow gauge railroad, connecting Seattle and the New Castle mine, in 1878. This mine is situated a little over 20 miles east of Seattle. It has produced more coal than any other mine in King County. It consists of a slope, on an angle of 40° to 41°, and has a depth of 1,350 ft. All coal mined here has to be hoisted from this level. A pair of hoisting engines, 24 x 34 ft., does the work; they are on first motion. An idea of the capacity of those engines may be formed when it is stated that on one day of October, 1891, over 1,000 cars were hoisted in 10 hours, besides hoisting the miners in the above stated time. The mine is ventilated by two fans. The one on the east side is of the Guibal type, 14 ft. in diameter, with one side opening. The one on the west side is a Cyclone, recently put in operation, and is 10 ft. in diameter. Drainage is as follows: On the fourth level is a Worth-



ENGINEERING & MINING JOURNAL

THE WASHINGTON EXHIBIT AT CHICAGO.

that characterized California's find in 1849. The Salmon River discovery was due to the efforts of Capt. E. D. Pierce, a prospector. The first shipment of gold was in January, 1861, when J. C. Smith, of Walla Walla, sent \$800 worth of gold dust to Portland, Oregon. Near the end of 1862 the Boise River mines were discovered, which drew a multitude of people there, but the Indians killed so many that the Government was forced to send troops to the Territory to quell the disturbances. From 1851 to 1876 the amount of gold taken out of the States of Washington and Oregon amounted to nearly \$30,000,000. From 1876 to 1892 the product of Washington in gold was \$3,074,156, and that of silver \$1,044,139.

Coal was first discovered in Washington in 1852, and the first mine of prominence opened up was the Bellingham Bay mine, at Sehome, Whatcom County. The mine has not been in operation for several years, and is now full of water. Coal was shipped from this mine in 1860. The mine consisted of a slope, sunk very near the bay, on an angle of 8° to 36°. The whole thickness of the vein was 14 ft., of which it is claimed to contain 10 ft. of clean coal, a lignite. The west gangway of the first level was abandoned before it had been worked to any extent, fearing the water in the bay would break in. The gangway running west on the third level was worked more extensively. When in operation, everybody seemed to be in dread of the water; but after operating the mine for nearly 18 years spontaneous combustion caused the mine to be flooded, and it was never reopened. The mine yielded some 250,000 tons in all.

New Castle mine was the first mine of note operated in King

County, forcing the water to the third level; on the third is a Cameron pump and a Deane pump, forcing the water to the second level; on the second level is a Whiting pump and a Blake pump, to force the whole product to the surface. No. 1, or water level, extends westerly from the slope to New Castle camp. This level drains all the surface water, thereby relieving the pumps of a considerable amount of work.

The area of coal bearing lands in the State is nearly 1,000,000 acres, widely distributed over 18 counties. The coal lands of the State are divided into seven great groups, viz.: The Roslyn, Kittitas County; the South Prairie and Wilkeson, Pierce County; the Green River Basin, King County; Skagit River, Skagit County; Bellingham Bay, Whatcom County; Bueoda, Thurston County, and Cowlitz, Lewis County.

King County, so far, holds the lead in production, but Kittitas County is rapidly advancing. The coals of the State in character are anthracite, bituminous, semi-bituminous, and lignite or brown coals. The first shipment of coal was in 1854, when some was sent to San Francisco. It was from the Bellingham Bay mine, and up to 1870 this mine was the only shipper of the State. During 1870 the Renton, Talbot and Seattle mines, situated near Seattle, commenced to ship, and up to the year 1874 the total output of the mines near Seattle was nearly 500,000 tons. From 1874 to 1879 a heavy decrease is noted in the output of these mines, but 30,000 tons being extracted. No record is obtainable of Washington's coal production during the years 1879 to 1884. Whatever work was done was entirely confined to the King and Pierce districts. In 1885 coal mining took a big jump, as is

shown from the fact that the production amounted to 380,250 short tons. The annual product from 1870, when it was 17,844 tons, is given in "The Mineral Industry." Since 1885 it was as follows, in tons of 2,000 lbs.:

	Tons.	Value.		Tons.	Value.
1885.....	389,250	\$736,500	1889.....	1,030,578	\$2,393,238
1886.....	423,525	925,931	1890.....	1,263,689	3,426,900
1887.....	772,601	1,639,716	1891.....	1,056,219	2,487,270
1888.....	1,215,750	3,647,200	1892.....	936,575	2,108,000

The price per ton was lowest in 1887, when it brought \$2.19. The highest was in 1888, when it reached \$3. There is little doubt that Washington, with abundant supplies of coal and timber and many valuable water-powers, will be in time the great manufacturing State of the Pacific Coast.

UNITED STATES MINERAL PRODUCTION.

A monument erected by the Government in the Mines Building is a most interesting study. It represents the actual amount in their order of minerals, ores and precious stones produced in the United States every second of time. The base consists of a large piece of bituminous coal, being some 5 ft. in diameter, as more coal is produced than any other mineral. The second in order is anthracite coal, and in following order are limestone, natural gas (coal equivalent), petroleum (coal equivalent), iron ore, granite, salt, sandstone, phosphate rock, Vermont marble, gypsum, marls, mineral waters, slate, grindstone, pyrites, talc, lead, copper, mineral paint, flint, bauxite, manganese ore, infusorial earth, sulphur, chromic iron ore, silver, novaculite, aluminum, gold and precious stones. From a base of 5 ft. cube the monument gradually diminishes to a cube barely an inch square.

THE LIDGERWOOD MANUFACTURING COMPANY.

This company has on exhibition, at F-28 in Machinery Hall, six styles of hoisting apparatus. Two styles of mining hoists are shown, one being a double-cylinder, friction-drum, reversible 50-H.P. engine the other a double-cylinder, reversible 20-H. P. Another engine shown is a double-cylinder, double-friction drum contractors' hoisting engine. A double-cylinder, single-friction, drum-hoisting engine is also shown, complete with boiler. Another engine on exhibition is a double-cylinder, six-winch reversible erecting engine used in bridge and building erection.

The company also shows the Locke-Miller cableway engine, especially designed for operating the Locke-Miller cableway, which is used extensively in dam and bridge building, open-pit mining, canal excavation, etc. An 110-H. P. electric hoist for mining purposes is exhibited by this company in the Electricity Building. The exhibit will well repay interested parties for investigation.

THE FRASER & CHALMERS' ENGINE

In Section F, south side of Machinery Hall, is the World's Fair engine of Messrs. Fraser & Chalmers. It has a rating of 1,000 H. P. and is speeded at 64 revolutions per minute. It is a four-cylinder, triple-expansion engine, having one high-pressure cylinder 20 in. diameter, one intermediate 34-in. diameter and two low-pressure cylinders each 34-in. diameter, the stroke being 60 in. The course of steam is from the high-pressure to the intermediate cylinder, and then, dividing, to the two low-pressure cylinders. The purpose of this arrangement of cylinders is to equalize as far as possible the turning momentum and the strains exerted on each crank. These are nearly equal under a very wide range of power, which is impossible with a three-cylinder quarter-crank engine, and there are also some advantages of economy of arrangement and distribution of dynamic forces over the three-cylinder triple crank engines. All the steam cylinders are steam jacketed on the heads, as well as on the cylindrical surfaces. The valve gear is of the regular Fraser & Chalmers Corliss type, presenting some advantage in simplicity over the special full-stroke gear, the cylinders being so proportioned that full-stroke gear is unnecessary. The cut-off gear of the high-pressure cylinder is always under control of the governor, the novelty appearing in the cut-off gears of the remaining cylinders. If there are no sudden changes of load the cut-off should be constant in these other cylinders in order to secure a uniform minimum drop of power. But if the load were suddenly and largely reduced there might remain steam enough in the receivers to cause the engine to speed up or even to run away, if all the steam were cut off from the high-pressure cylinder. On the other hand also, with the sudden imposition of a great increase in load, the increased admission of steam in the high-pressure cylinder might not be sufficient to maintain the speed of the engine. To guard against these contingencies the cut-off of the governor will not affect the intermediate or low-pressure cylinders, the cut-off cams being held in position by springs. But any sudden motion of the governor transfers itself instantly to the cut-off cams, which, after this influence has passed, again slowly recede to their normal position. In short, the cut-offs of intermediate and low-pressure cylinders are changed only in emergencies, and not long enough to reduce the economy of the engine. Other details of the engine are of less peculiar importance, but they are designed in accordance with the latest engineering practice. The crossheads are steel castings. The connecting pieces between the cylinders are made in halves, so that they may be taken apart for convenience in examining cylinders and pistons. The engine is run as a condensing engine, the condenser being furnished by the Conover Manufacturing Company, of New York, for exhibition in connection with it.

Action of Sulphuric Acid on Platinum and Iridium Alloys.—In an experiment made at the Gressheim works by Herr Heraeus the loss on absolutely pure platinum in sulphuric acid being taken as the unit or 100, that of pure platinum with 5% iridium was 73; of pure platinum with 10% iridium 58, of a technically pure platinum made by Heraeus 90, of platinum from an English boiler 103, and of fine gold 10. In consequence of these experiments, Heraeus now uses retorts of platinum coated with gold, which are said to be very serviceable.

THE BRITISH IRON TRADE IN 1893.

Written for the Engineering and Mining Journal by S. H. Norths.

The iron trade of Great Britain during the first six months of 1893 has shown signs of having touched its lowest point, and of having turned from the ebb. This change in its course will naturally be a slow one in regaining even its normal condition of prosperity, for absolute prosperity in the iron trade of any country, and especially one in the unenviable position of the United Kingdom, needs cheap raw material, cheap and efficient labor and advantageous transportation facilities. With Germany on the one hand and America on the other, England has not one essential to a prosperous condition, the mutual agreement of the laborer with the capitalist. So far as any figures referable to the iron and steel industries are concerned, they show a gradual improvement. It is too early yet to deal with the production itself, but the utilization of the product is, in part, to hand for the first six months of the year. All disturbances of labor, must be borne in mind when reviewing a period. The strike of Hull dockers, of the Dundee millworkers and many other less important disagreements are among the former; while the collapse of so many Australian banks acted under the latter head. Considering these points, it may be thought that the improvement in the iron trade of Great Britain is greater than it might have been.

The chief items of interest in the statistics of exports and imports for the six months are those showing the foreign demands for pig iron, railway material and tin plates, as well as the importation of iron ores. As a whole, the exports of iron and steel show an increase over the first half of 1892 of 165,726 tons, not including machinery or hardware and cutlery, both of which have apparently decreased. In regard to pig iron, the increase of foreign shipments has been nearly 60,000 tons, which has been caused by the demands of continental countries, more especially Germany, which has taken more than half as much again, rather bearing out the report, made some time ago, that continental makers could purchase and ship pig iron from England for less than it would cost them to produce it at their iron works. This is an advantage of trade depression to some countries, but by no means solacing to the British manufacturer. The export of steel rails has been augmented by over 60,000 tons, the principal advances occurring in the cases of British India and British North America. The former country has taken more than double the quantity of 1892, and this has nearly trebled her importation of locomotives, the value rising from £84,379 in 1892 to £226,798 in 1893. The foreign shipments of tin plates from South Wales also show increases amounting to over 10,000 tons, exports to America being 160,420 tons, as against 143,021 tons in 1892.

The details of iron and steel exports for the six months ending June 30, 1893, and 1892, are, as follows, in long tons of 2,240 lbs.:

	1893.	1892.		1893.	1892.
Pig iron.....	390,829	332,391	Tin plate and sheets.....	217,567	206,777
Bars, angle, etc.....	76,718	89,093	Cast and wrought.....	145,786	172,965
Rail.....	277,739	193,417	Old for re-manufacture.....	65,128	45,856
Wire.....	19,706	25,617	Steel unwrought.....	82,922	71,235
Hoops, sheets and plates.....	72,123	56,505	Manufactures of steel and iron.....	10,845	7,436
Galvanized iron.....	84,183	76,570			

The importation of iron ores still increases, and now for the first six months of this year the supply amounted to 375,615 tons, as against 246,214 tons in the first half of 1892, when the supply of Cleveland ores was stopped for nearly three months. There certainly must exist a very important reason which will cease manufacturers at home, where there are sufficient stores of ore of high quality to supply them for years, to turn to foreign mines and import in such quantities. If it is not quantity it must be cheapness, and the vein ore proprietors of the United Kingdom must be adopting a short-sighted policy if they cannot bring themselves to compete with foreign ore which has to bear the burden of a long sea voyage.

Analysis of Aluminum.—In the "Chemiker Zeitung," Dr. A. Roessel describes his method of determining the iron silicon in commercial aluminum. Three or four grammes of the aluminum are gradually introduced into 35 c.c. of hot potash-lye (30–40%). The metal dissolves and leaves a black flocculent residue. This is supersaturated with pure hydrochloric acid in a platinum capsule without previous filtration and evaporated to dusty dryness. The mass is then moistened with hydrochloric acid and the silica is determined in the ordinary way. For determining the iron, Dr. Roessel dissolves 3 to 5 grammes of the aluminum as before, and mixes the result with an excess of dilute sulphuric acid, heats until the solution is clear and filtrates with permanganate. Care must be taken in these determinations that the potash-lye is free from silica.

Application of Natural Gas in Chemical Work.—In a note to the Chemical Section of the Engineers' Society of Western Pennsylvania, Dr. F. C. Phillips says: "Besides its use in agitating a liquid, natural gas forms a convenient substitute for carbon dioxide or nitrogen in many cases where an inert gas is necessary. In drying substances liable to oxidation if exposed to air, I have often used a natural gas stream. The substance to be dried can be placed in a flask which is heated over a water-bath and gas passed slowly through the flask. As natural gas does not exert any reducing action at moderate temperatures, it is usually quite as well suited for such a purpose as pure nitrogen. It is a common practice in distilling organic liquids of high boiling point to send a current of steam through the still to expel the heavy vapors and hasten the distillation. I have found that natural gas serves better than steam, and it is, of course, much more easily controlled.

"Sulphur compounds may, and probably do, occur in natural gas, but in such small quantity that ordinary reagents fail to give any indications even when several hundred cubic feet of gas are used. With the increase in heavy hydrocarbons that has been observed during the past two years, it is probable there has been a somewhat greater proportion of sulphur compounds. Whether this is a coincidence or not I cannot say."

THE MICROSTRUCTURE OF INGOT IRON IN CAST INGOTS.

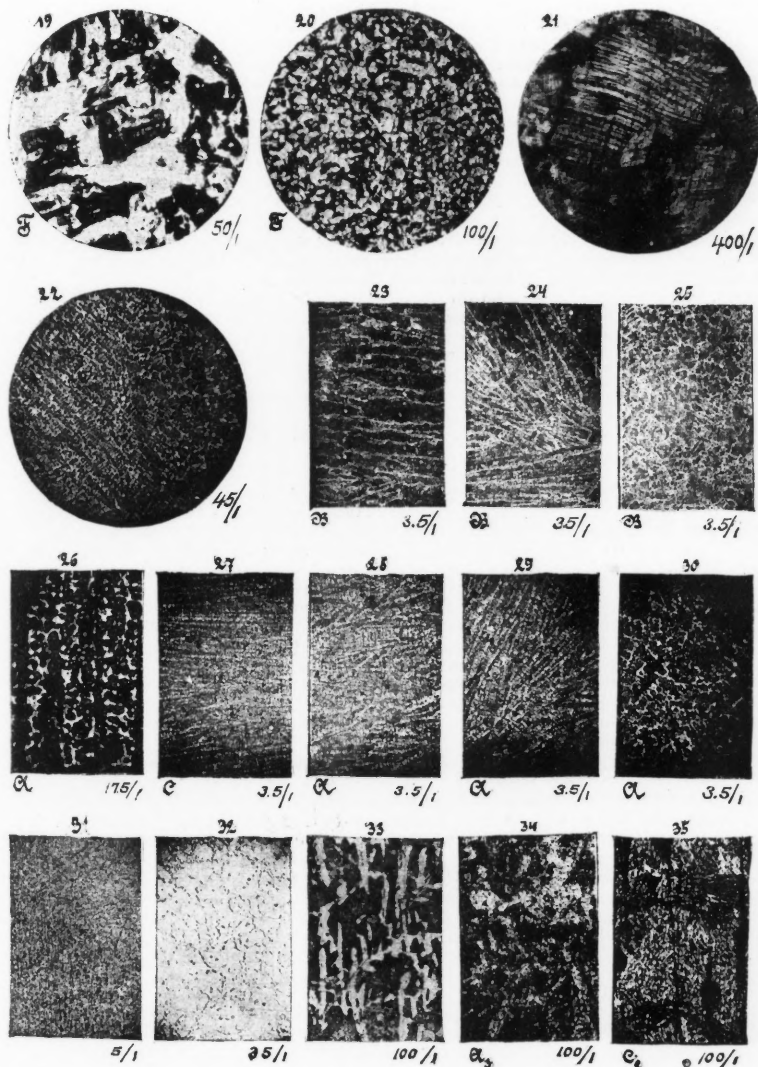
By A. Martens.*

(Concluded from page 242.)

The bright substance in the light-colored veins (Plate XIV., Fig. 3), which has repeatedly attracted our attention by its sharp separation from the surrounding mass, may probably be another special component of the structure, but as yet I have not succeeded in establishing its character by incontrovertible proof. A circumstance of possible bearing on the case is that the parallel spines which start from the borders of the grains, presenting a regular arrangement, notably at the leafy edges, and penetrating into the body of the grain or mesh-surfaces, are frequently less well-defined against the meshed field than are the border-zones. On Plate XIV., Figs. 5 and 6 represent crucible-steel of medium hardness from Bochum with 0.4% car-

PLATE XIII.

Details.



A, B, C, Bessemer metal in its original condition.

A₃, Bessemer metal heated and slowly cooled.C₂, Bessemer metal heated and quenched.

F, Open-hearth metal in its original condition.

bon, etched in aqueous chlorhydric acid. In Fig. 5 a magnifying power of 25 diameters shows that the borders of the grains consist of well-defined, non-continuous white surfaces, from which, yet not coming into actual contact with them, the parallel spines extend.

The origin and cause of the blue and brown furrows in the veins of the network, which have been repeatedly referred to and illustrated, cannot at the present time be ascribed to a special structure-former; the subject is one for further study.

The degree to which the etching is carried always exerts a noticeable influence on the structural phenomena, though rarely injuring their characteristic qualities. But that such injury may occur, my experience on a former occasion has shown. Aside from this, however, the kind of reagent employed exerts an unmistakable effect on the appearance of the structure. This may be readily seen by comparing Figs. 23, 24, 25, 28, 29 and 30 on Plate XIII. with the series

A₁ and B₁ on Plates V. and VI., taken from the same cross-sections of the ingot. The two series were etched in aqueous chlorhydric acid, while the plates which furnished the figures on Plate XIII. were treated with nitric acid dissolved in ether containing a little water. This latter mode of etching has produced sections characterized by a dark, uncolored ground from which the bright surfaces stand out sharply; it is true, the light substance is also attacked by the acid, for the fine white lines in the surfaces of the grains in A₁ f and B₁ f are wanting, and instead of the blue, fine-grained portion, the plates show a much coarser grain, just distinguishable by the depressed veins in Figs. 25 and 30, but more conspicuous in Fig. 26. As a further result of etching with nitric acid, the white parts become far more distinctly isolated, appearing as disconnected rows of dots (Fig. 27). The use of an alcoholic solution of chlorhydric acid produces likewise an extraordinarily sharp separation of two structure-builders, and thus is particularly suited for photographic reproduction because

PLATE XIV.

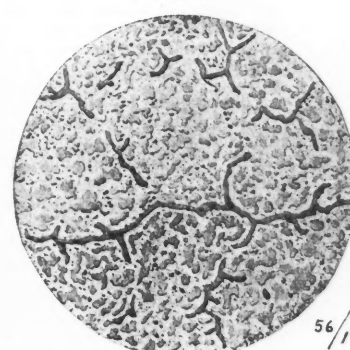
All samples from cast ingots of the Bochum Steel Works.

FIG. 1.



Thomas metal; C = 0.06 per cent.

FIG. 2.



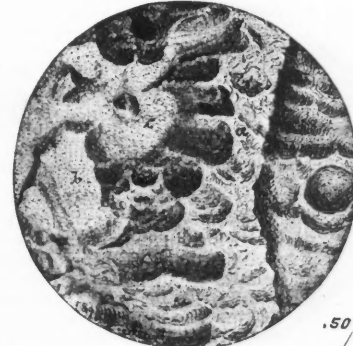
Open-hearth metal; C = 0.1 per cent.

FIG. 3.



Open-hearth metal; C = 0.25 per cent.

FIG. 4.



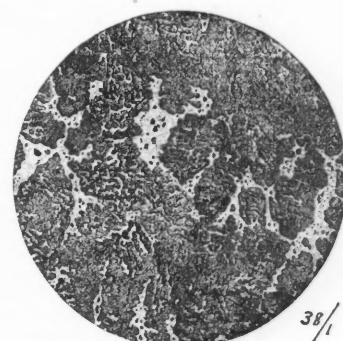
Open-hearth metal; C = 0.1 per cent.

FIG. 5.



Crucible metal; C = 0.4 per cent.

FIG. 6.



Crucible metal; C = 0.4 per cent.

the less actively corroded parts appear in brilliant white on a dark ground (Plate XIII., Figs. 31 and 33; structure of a Bessemer rail).

Frequently the different elements of the structure can be brought out by simple polishing, especially when it is done on a soft support, like rubber (Plate XIII., Fig. 32); the harder parts then remain in relief. The experiences above recorded may serve to show that very much attention will still have to be devoted to etching-methods. By depending on a single, perhaps imperfectly applied, method, one may easily be led to wrong conclusions.

The Nicaragua Canal.—A receiver has been appointed for the Nicaragua Canal and Construction Company on the application of Louis Choble, one of the stockholders. The application was acquiesced in by Warner Miller, president, who says that the company has no longer means to meet its obligations. The company was organized under the laws of the State of Colorado in 1887, capital \$12,000,000, all of which was paid up.

* Abstract of paper read before the International Engineering Congress in Chicago.

ABSTRACTS OF OFFICIAL REPORTS.

UNITED MEXICAN MINING COMPANY, LIMITED, MEXICO.

The work of this company for the year ending December 31st, 1892, shows a gross profit of \$107,921 (Mexican) which at 42d. to the dollar amounts to £18,886. It was derived as follows: Profit on El Cubo mines, £16,121; profit on mill, £967; proportion of profit on San Cayetano mines, £2,087; or a total of £19,175, which, less expenses of management in Mexico and sundries of £289, leaves £18,886. The approximate rate of exchange, however, is but 32d. per Mexican dollar, which reduces the above amount to £14,389. Of the above amount, £1,522 was expended upon management in London, £7,618 was expended in paying interest on debenture, £2,328 was charged to profit and loss for loss in exchange, and £7,418 was carried forward as a balance. The balance sheet shows an authorized capital of £1,056,654, of which £953,797 has been paid in. Debentures (8%) authorized £100,000, of which £95,230 has been paid in. There has been a total of £1,052,854 expended on the mines.

The output of the mines in 1892 and 1891 was as follows: In 1892, \$478,685, of which \$320,397 was from El Cubo mines, and \$158,288 from the San Cayetano mines. In 1891, \$461,940, of which \$300,554 was from El Cubo, and \$161,386 from San Cayetano.

PORT PHILLIP GOLD MINING COMPANY, LIMITED, VICTORIA.

The report for the year ending March 31st states: Since the issue of the previous annual report work on the lodes and exploring has been carried on at the mine with varied results. From June to December, 1892, the quartz raised was 2,044 tons; gold obtained, 409 oz.; average per ton, 4 dwts; value, \$8,300. After payment to tributaries, carting and crushing quartz and assiting tributaries, a profit of \$540 was obtained. A large amount of capital has been expended in explorations, which as yet have not proved remunerative; the driving for the German Reef, from which good results were expected, did not show anything of value, and the work in that part of the mine had to be stopped for the time being. The reef is known to traverse the greater part of the company's property, and is, comparatively speaking, untried, but at deeper levels may prove payable. From January to June 1st, 1893, the quartz raised was 1,816 tons, yielding 294 oz.; value, \$5,900; averages, 3 dwts. 5 grs. per ton. This, however, is not good enough for profitable work, and the directors are satisfied that the future prospects of the company must depend on the deeper developments. The directors have been in negotiations with the adjoining companies—namely, the South Clunes and Dixon's New North Clunes companies, to carry out a scheme of amalgamation, whereby the whole of these properties may be brought under one organization and worked to better advantage. The amalgamation of these three properties would embrace the principal portion of the Clunes goldfield, covering over 2½ miles on the lines of lodes that have already produced gold to the value of nearly \$25,000,000, and from which a profit of \$10,000,000 has been realized.

AMERICAN BELLE MINES, LIMITED.

The report of this company for the year ending December 31st, 1892, is, owing to deficiencies in the data given, an unsatisfactory document. Its financial statements are contained in what are called a balance sheet and revenue account. Neither of these is sufficiently itemized to be useful, and dates are utterly neglected.

From the revenue account we learn that receipts during the year amounted to \$36,008, of which \$33,940 was received from sales of ore, the balance being from transfer fees, interest on loans, rent of boarding houses and adjustment of exchange. To this is added \$275, value of ore on hand at the end of the year. The expenditures amounted to \$102,349. To these is added \$1,052, value of stock on hand at beginning of the year. Consequently the gross deficiency for the year amounted to \$67,118. The deficiency the previous year was \$50,583.

This show is far from encouraging, and this was early recognized by the company. Mr. Crowther, one of the directors, visited the mines early this year. He succeeded in getting more favorable terms from the Smelting and Sampling Works, and reports that the chances for the property show improvement.

Mr. James K. Harvey, the superintendent, reports on the year's work as follows: The surface improvements consist of a shaft house, an ore house at the main shaft and one at the north tunnel; also various ore shutters and snowsheds. At the National Belle mine the stopes run from 8 to 26 oz. of silver and from 12 to 14% copper.

At the Silver Bell mine the ore runs from 8 to 50 oz. of silver, and from 0.1 to 0.2 oz. of gold, but no copper. Operations were limited on the south ore body, at the South Day Tunnel, in consequence of the winter having set in before the Standard smelter at Durango was in a position to receive National Belle ore. No ore of value has yet been discovered at No. 4 level. The ore being extracted from the north ore body at No. 2 level maintains its value as the stope is being raised. Some galena, which occurs in streaks throughout the mass of copper and iron pyrites ores, has produced by the 10-ton lots 44 oz. silver per ton with 60% lead. South of the shaft, at No. 2 level, has been discovered the south ore body, on which considerable work has already been done through the South Day Tunnel. No. 2 level, south, being about 215 ft. below the base of the South Day Tunnel. It gives a considerable piece of ground over the back of level for stopping purposes, provided the ore holds through, which at present there is no reason to doubt. The ore extracted from the points in operation at No. 2 level, south, shows an improved value over the ore met with at the north ore body. This, taken with the strength, character, general appearance and favorable occurrence of the ore, speaks well for productive and profitable working in depth.

Silver Bell Mine.—Operations have been conducted throughout the year south of the shaft, principally at Nos. 1, 4, 6, 8, 9 and 10 levels. Unfortunately the ore met with has been exceedingly low in value, especially the ore extracted from the lower levels. Both at the Silver Bell and National Belle mines things are in good condition for rapid and economical working. At the Silver Bell Mine there is consider-

able ore exposed at the different points in operation, but of very low grade. The unsatisfactory results obtained at the Silver Bell during the year have been entirely owing to the very low value of the metallic contents of the ore encountered, coupled with the unprecedentedly low price of silver which has prevailed during the past 12 months.

TOMBSTONE MILL AND MINING COMPANY, ARIZONA.

The report of this company for the year ending June 30th, 1893, shows that the receipts from ore sales (returns from smelters) were \$282,787; from interest, etc., \$1,280, making a total of \$284,067. The expenses were: Mine labor, \$133,186; supplies, \$33,321; ore hauling, \$22,798; general expenses at mines, taxes, development, etc., \$22,672; salaries and office expenses, \$10,791; total, \$222,768. This leaves a net result of \$61,299, from which interest on Series D bonds was paid, amounting to \$46,020; leaving a balance of \$15,279, which, added to \$60,025 on hand at the beginning of the year, left a cash surplus or reserve of \$75,304 at its close.

The amount of ore and the average grade per ton from each of the company's mines was: Lucky Cuss 3,729 tons, grade 25.15 oz. silver, 0.11 oz. gold, 2.59% lead; West Side Sulphuret 1,184 tons, grade 48.61 oz. silver, 0.82 oz. gold and 7.58% lead; Northwest 1,427 tons, grade 87.05 oz. silver, 0.18 oz. gold and 10.12% lead; Toughnut 2,096 tons, grade 55.45 oz. silver, 0.61 oz. gold, 12.91% lead; Charleston 16½ tons grade 21.80 oz. silver, 0.18 oz. gold, 5.50% lead. The total amount of ore raised was 8,452 tons, yielding 392,165 oz. silver, 2,950 oz. gold and 1,205,000 lbs. lead, an average of 46.39 oz. silver, 0.35 oz. gold and 7.12% lead per ton. The average return per ton of ore was \$33.46. The average cost was: Mine labor, \$15.76; supplies, \$3.94; hauling, \$2.70; other expenses, \$3.96; total, \$26.36. This shows a profit of \$7.10 per ton.

The report of Superintendent W. T. Staunton says that the production of ore exceeded that of the previous year by 1,425 tons, but the average grade decreased 19.13 oz. per ton in silver and 0.242 oz. per ton in gold. Estimating these metals at the average prices received for them during the year, the decrease in the value of the ore is found to have been \$19.84 per ton. The average price of silver upon which settlements were made during the year was \$0.8326 per ounce, and during the preceding year \$0.9243, a decline of \$0.0917 per ounce. The decline in the value of silver, therefore, amounted to \$34,157.58 on the product of the year. The simultaneous decline in the price of silver and the grade of ore will amply explain the decreased receipts of the year.

Aside from the decreasing value of silver, the outlook for the coming year is rendered less favorable than that of last year by a decrease in the ore reserves in sight; by the increasing cost of mining with increasing depth and distance of the working places from the shafts, and by uncertainty as to the grade of such ore as is known to exist. There is still much unexplored ground, some of which is exceedingly promising, and it is believed that with a fair price for silver a moderate profit can be earned and at the same time considerable development work sustained.

The amount of new workings opened during the year aggregated 9,213 lineal feet, or 25.4% less than during the preceding year, while the total amount of rock of all kinds hoisted was 52,067 tons, or only about 2% less than during the preceding year. Of the total amount of rock hoisted, only 8,452 tons, 16.2%, was ore of shipping grade, and was sent to the smelter.

The average number of men employed during the year was 135. On June 30th the number was 118. Those employed directly at the mines were divided as follows: Lucky Cuss, 26; West Side Sulphuret, 23; Northwest, 26; Toughnut, 37. In regard to occupation, they were divided as follows: Foremen, 4; miners, 69; engineers, 7; topmen, 4; carmen, 11; ore-sorters, 9; blacksmiths, 4; timbermen, 2; pumpmen, 2; office, assay office and stable, 6. This force has been reduced during the month of July to 41, distributed as follows: Lucky Cuss, 8; West Side, 7; Northwest, 6; Toughnut, 15; general, 5. The Toughnut was the most productive mine during the year.

The use of the diamond drill covers a period of about 14 months. The first work was in the Lucky Cuss mine, using compressed air as motive power. Twenty-one holes were bored at this time, of an average depth of 116.62 ft., aggregating 2,449 ft. Time of actual boring, 1,555.5 days of 10 hours. Average rate of boring per day, 15.75 ft. The cost was, for actual boring and removals, \$4,242, or \$1,731 per foot; the total cost, including purchase of machine, was \$8,036, or \$3,280 per foot. The next work was a vertical hole on the Gilded Age claim to test the formation, and involved the sinking of a shaft 92 ft. deep to reach rock of sufficient firmness to use the drill. A hole was bored to a depth of 344 ft. below the bottom of the shaft. The cost was: For sinking shaft, 92 ft., \$1,298, or \$14.11 per foot; for boring 344 ft., \$1,267, or \$3.68 per foot, making a total, 436 ft., of \$2,565, or \$5.88 per foot. Finally, seven holes, aggregating 259 ft., were bored in the Lucky Cuss sixth level. No. 3 winze, with a small machine purchased for the purpose, using hand power at first and afterward compressed air. The cost was \$513 (\$1.98 per foot), or, including the first cost of machine, \$991 (\$3.44 per foot). Exclusive of the first cost of the machinery and the cost of sinking the shaft, there has been expended on diamond drill work \$6,022, or \$1.97 per foot. The total expenditures on account of diamond drill work is \$11,592, or \$3.68 per foot drilled. The results obtained are not such as to encourage the continued use of diamond drills in this property.

The Longevity of Miners.—Prof. Philipson, president of the British Medical Association, recently stated that there are few diseases peculiar to miners. The pitman's asthma is much less frequent than formerly. Contrary to what might be expected, rheumatism and rheumatic fever rarely affect the coalminer. The miners of the north of England have an average of three years longer life than the average Englishman, eight years longer than the Cornish miner, nine years longer than the South Wales miner, and only one year less than that of the men of the healthiest districts in the kingdom.

A NOTABLE MINING LAWSUIT.

Written for the Engineering and Mining Journal by H. M. Beadle.

The Montana Mining Company, Limited, of London, England, owns among other claims and lodes on the western side of Cruse Mountain, a spur running northerly from the main chain of the Rocky Mountains, the Marble Heart, Maskelyne No. 1, and Nine Hour lodes. At a point about 300 ft. north of the south line of the Marble Heart is the northeast corner of the St. Louis lode, called Corner No. 1. The line dividing the property of the two companies from this point runs S. 21° 15' W. 1,079 ft. to Corner No. 2, thence S. 51° 30' W. 403 ft. to Corner No. 3 of the St. Louis lode, which is owned by the St. Louis Mining Company, of Montana.

On October 14th, 1890, the St. Louis company began a suit in the State courts against the Montana company to recover the value of ore taken out of the Drumlummon vein south of the extension of the north end line of the St. Louis claim, claiming damages in the sum of \$2,000,000. The suit was afterward transferred to the United States Circuit Court. The main point involved was the right of a company holding the oldest location to a vein which extended laterally into the proper of another, to the ore in the vein, whose apex was divided by the side line between the parties.

The St. Louis company claimed to have the apex of the Drumlummon vein within the side lines of the St. Louis claim from a point about 200 ft. north of their southwest corner to a point about 460 ft. south of the northeast corner, where the hanging wall crossed the side line and continued east of it all the way to the extension east of the north end line, the foot wall remaining within the St. Louis claim to its north end line. It was claimed by the plaintiff that the Drumlummon lode was from 26 to 75 ft. in width throughout its strike. It dipped to the east, the inclination on the surface being about 58°, but increasing in depth.

The St. Louis company claimed that cuts on the surface showed that the vein was as wide as was given above, and that it was further shown by the sinking of the incline shaft of the company on the footwall for 375 ft., with crosscuts to the hanging wall, and by drifts and crosscuts connecting with the Cruse level on the Drumlummon vein. Drifts were run from the incline shaft at a depth of 30 ft. along both foot and hanging wall, showing perfect walls for several hundred feet. Between the walls the vein was principally filled throughout, except where the ore shoots were found, with what the experts for the plaintiff called "vein matter," in the shape of slate breccia, proving that the vein had been filled with country rock, which had been broken, and the particles re-cemented together. Even in the ore shoots matter of this kind could be found.

Both parties agreed that the Drumlummon vein was a true fissure in slate, lying just east of a contact of slate and granite, tongues of the latter occasionally forming the walls of the vein for short distances. Granite or syenite was also found on the east of the vein, the defendants claiming that it was of considerable extent. The experts differed as to the kind of slate the country rock was composed of, some claiming it to be magnesian shale or magnesian slate, and others claiming that it was common clay slate, which near the contact showed traces of magnesia and lime. The slate is nearly black where it is massive, but whitens on exposure to the weather. There are porphyry dikes or elvans penetrating both slate and granite in several directions. Dr. R. W. Raymond said in his testimony for the defendant that the occurrence of the rocks was of much the same character as seen in Cornwall, England.

The Montana company claimed that what the plaintiff called the "gongee" on the hanging wall was the vein itself; that in the barren portions the vein was only 2 or 3 ft. wide at most, often narrowing down to a few inches, and only widening out when ore shoots occurred, and denied that the vein was as wide as claimed, and said that what plaintiff called a foot wall was a simple crack in the country rock; that what the plaintiff called "vein matter" was not vein matter in any sense of the word; that it was slate altered by near contact with the granite; that it contained no gold, silver, copper, cinnabar, or lead whatever. It was further averred by defendant that the foot wall of the plaintiff did not extend on the surface or at depth to the extent claimed by plaintiff; that north of the St. Louis incline the wall exhibited by the plaintiff as a foot wall was not a continuous wall; that the cut followed slips in the country rock, and that at one place the granite extended across the foot wall into the country east of the alleged foot wall. What the plaintiff called the hanging wall of the Drumlummon vein was probably the hanging wall, but that fact had not been demonstrated; the most that could be said of the statement was that it was probably true.

The plaintiff claimed that the vein was demonstrated to be the same the Montana company had followed on the 400 level, because the Sampson stope reached from the Cruse level, which the works of the company had tapped, to the 400 level, and thence the vein could be easily followed to the 1,000 level, the foot wall and hanging wall being well marked at several places.

The defendants explained that what the plaintiff called the hanging wall of the Drumlummon vein on the 400 level was the hanging wall of the Castletown lode, which approached the Drumlummon lode from the north, making a junction with it at or near No. 1 shaft, but separating again from it as it ran south, uniting with it at the Sampson ore shoot, and again separating from it and uniting with it again at the Jubilee ore shoot. Between its first junction and the Sampson shoot there was well defined country rock, showing the foot wall of the Castletown and the hanging wall of the Drumlummon veins. The same facts were observable between the Sampson and the Jubilee ore shoots. Besides the gangue of the two lodes was different, and the ores of the two veins were unlike, as they carry gold and silver in different proportions. In the Drumlummon vein, the value was principally in gold; in the Castle-

town vein, the principal value was in silver. There was a well defined parting between the ores of these two veins in both the Sampson and Jubilee ore shoots, and the opinion was held by the Drumlummon people that further exploration would show that the Castletown lode separated from the Drumlummon lode at the Jubilee shoot and continued south a distinct vein.

The location of the foot wall, as defined by the plaintiff on the 400 level and below, was denied as to points near shaft No. 2. One of plaintiff's experts thought he saw the foot wall in the North Star vein, which crosses the Drumlummon several hundred feet north of shaft No. 1, and is faulted by the Drumlummon vein. The defendants said this could not be the foot wall, or the North Star vein would have been faulted from that point, whereas it was faulted from a point over 20 ft. east of the alleged foot wall. Plaintiff found a foot wall in the workings about the pump station at shaft No. 2, but defendants proved that farther west than the point at which the alleged foot wall was found an upraise had been driven to the No. 2 A level, perpendicularly, until the vein was reached, which then followed the vein to said level, and that no foot wall, or wall of any kind, was observable in this upraise until the vein was reached.

Plaintiff claimed that for about 800 ft. south of the Jubilee shoot the level ran along the hanging wall, and that just north of shaft No. 3 the foot wall was visible in several places, and that the latter shaft was plainly on the Drumlummon lode.

The defendant said that the level from the Jubilee shoot south ran on the vein, which was often not more than 3 in. wide, until what is called the Rogers vein was struck, and that from this point to shaft No. 3 the level was run by a transit, and was called the transit level. It had yet to be proved that the ore found in the workings connected with shaft No. 3 were on the Drumlummon vein. South of the shaft the vein was cut off by a dike with a strike nearly at right angles to the vein, and whether it faulted or terminated the vein had not been determined.

During the trial Judge Knowles appointed a referee to examine the books of the Drumlummon company, and have such as bore on the questions at issue brought into court, and on motion to dismiss the suit, which he overruled, he held "tentatively" that where the apex of a vein was in two lode claims it belonged to the claim that was first located.

The jury visited the property in controversy, visiting such of the points spoken of in the testimony as could be reached without climbing or being hoisted or lowered underground. On their return, the case was argued, and Judge Knowles' instruction given; the jury after being out about two hours found for the defendants on all points in controversy.

It was obvious from the beginning that the verdict would be for the defendants. The burden of proof was upon the plaintiff. It was not proved by any satisfying evidence that there was any ore found in the surface of the vein, nor was it proved that the ore taken from the workings at the Apex shaft was on the Drumlummon vein, while that was probable. The foot wall which the plaintiff attempted to show was a vague and uncertain thing. The evidence of the witnesses for the plaintiff did not prove that it was the foot wall of any vein, and surface cuttings alone can never demonstrate a wall of a vein when a contest is made.

Who owns a vein whose apex is divided by the side line of two claims owned by different persons? has not received any solution. If the verdict should be appealed from, it is barely possible that the Supreme Court will be enabled to pass upon that point.

Method of Casting Steel Ingots.—At the Nykroppa Iron Works, in Sweden, a method of consolidating steel ingots, by subjecting the freshly filled mold to pressure developed by centrifugal action, has been introduced by the manager, Mr. L. Sebenius, according to "Stahl und Eisen." The apparatus consists of an upright shaft in the centre of a cylindrical casting pit, carrying a frame of four arms, to each of which is articulated a platform supporting four ingot molds. While the shaft is at rest, the molds are upright, and are filled in the usual way, but when it is set in rapid rotation they fly up into the horizontal position, and a pressure in the direction of the length of the ingot is developed equal to 30 times that due to the column of liquid metal in the mold, which drives the gases out, and produces a perfectly solid casting. Uniformity of composition is also induced, as on account of the rapid cooling liquation is prevented. The process, which has now been in use about two years, has been applied to both the Bessemer converter and to the open-hearth furnace. The ingots are free from external defects, and the loss by defective ends has been diminished 40%, the metal being so compact as to bear rolling to finished sizes without the use of the cogging-mill. The cost of the apparatus is about \$2,000 for a three-ton and \$4,000 for a 10-ton charge.

The circumference described by the bottom of the molds, when spun up into the horizontal position, is about 67 ft., corresponding with the working speed adopted of 125 revolutions, to a velocity of nearly 10,000 ft. per minute. The pressure on the mold taken at 30 times the depth of the ingots will be about 150 ft. of iron or from 500 to 600 lbs. per sq. in. In the form of the apparatus intended for smaller ingots the molds are arranged on an inclined position and radially to a central fixed vertical feeding tube upon a turntable, which is set in rotation after filling, or the latter operation may be performed while the table is actually in motion.

There is a later modification of the apparatus, in which the rotating table, being smaller in diameter than that previously adopted, can be driven at a higher speed, up to 200 revolutions per minute. There are eight pivoted molds, each divided by internal walls, so as to give nine small ingots suitable for wire billets or thin sheets. By means of a central annular funnel lined with refractory material, and provided with eight feeding spouts, or one for each group of molds, the whole number of 72 ingots is cast by a single pouring from the ladle, which contains from four to six tons of steel.

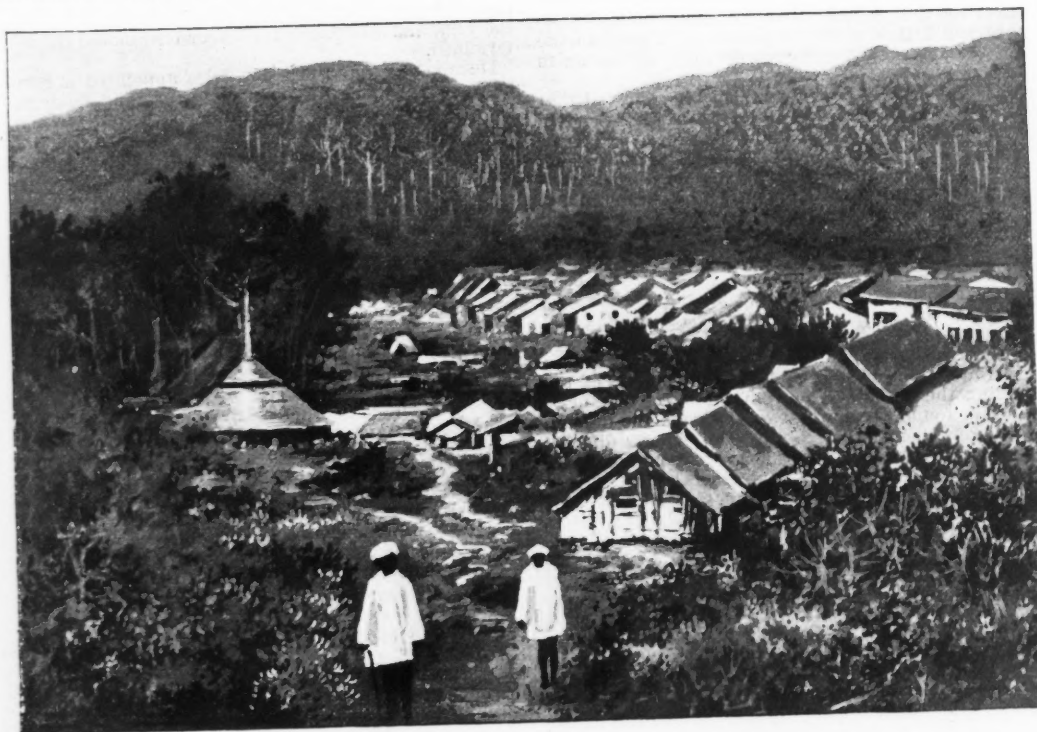
THE PERAK TIN MINES.*

The tin-bearing area of the Malay Peninsula is estimated to have an extreme length of 1,200 miles, and few portions of Malaya are destitute of indications that the metal exists beneath the surface. Singularly enough, the whole product as yet met with consists of alluvial ore, known as "stream tin," and is obtained by simply washing the soil after the superincumbent layer of clay or gravel has been removed. Veins or deposits in rock formation remain undiscovered, although natives occasionally aver that they have seen large lumps thus procured. As the local governments have offered a fair reward for any information as to the existence of veins, it seems hardly probable that the Malays, who prefer to make money in any way rather than by hard work, would have neglected such a chance. Practically speaking, at all events, the tin of the country is derived exclusively from tin sand. Certain portions of the peninsula are naturally more productive than others, and Perak, or the "Silver State"—why so named is a mystery, as no silver has been found there—stands at the head in this respect. The annexed sketch map will show its position. The richest district of the State lies a little to the eastward of the right branch of the Perak River, known as the Kinta River—the Kinta district occupying the southern half of the entire area.

The great industry is carried on in a similar way throughout the country, so that a description of the methods pursued in Perak applies to Malayan mining generally. It must not, however, be supposed that the Malays are the miners of the place. A few "ancestral mines," as mines which have been worked by their fathers and forebears, are indeed in Malayan hands. But the great majority of the working class in the peninsula—as, indeed, everywhere else, of they can get a foot-

nally reached a sort of wooden spade is used in place of the chankol to work up the sand. The next necessity is to provide wooden planking to build the waterways, as without water no mine is workable. The stream thus obtained turns a rudely made undershot water wheel 4 ft. to 5 ft. in diameter, and about the same in width. A sprocket wheel on the axle serves to work the well known Chinese pump, familiar to all who have visited exhibitions or museums. It resembles the old chain pump, but the pistons are square instead of round. When used at the angle shown in the drawing Fig. 4, these work in a three-sided trough, passing over another sprocket wheel placed at its foot. For more perpendicular work the trough is closed, and thus becomes a four-sided pipe. The trough passes through a water-tight box in the wheel shice, into which it empties its contents; and as it is always at work, it effects the end in view well enough.

From 10 ft. to 12 ft. of overburden is the average that has to be removed before the karang, or tin-bearing drift, is reached, and water usually appears at about this depth. Assuming the vein to be satisfactory, and the pit kept well drained, the coolies load their ragas with the tin sand, gravel, and soil, of which the drift consists, and convey it up planks to the edge of the pit. The baskets are either carried singly or from a bamboo yoke in pairs, and the drift is then thrown into the head race. The shice-box is frequently made of a tree split lengthwise and hollowed out. Small dams are placed at intervals in the race to retain the rich dirt, which is again and again reworked, until only the biji, or tin sand, remains. To smelt the biji, two forms of furnace are employed. One in use by the Malays is supplied with a blast from two upright cylinders. It is of the form shown in Fig. 5, and is built of clay. The Chinese smelting furnace,



MINING VILLAGE IN THE PERAK TIN FIELDS.

ing—are Chinese. Untiring in his toil, sober, to be relied on if well treated, and willing to work for wages on which any one else would starve, while his chief vices—gambling and opium smoking—are only indulged in when the day's toil is completed. Ah-siu and his friends are the pioneers of the Eastern world. It is usually agreed that the miners shall receive a share of the profits made by each mine, the small sums paid them meanwhile being treated as advances from the amount finally due.

Let us see how the Chinaman sets about opening a mine. It seldom happens that the would-be tin-digger is a man of means. He therefore goes to some richer friend, who agrees to advance the necessary money upon condition that the metal obtained is sold to him exclusively, and that all the tools, food, opium, and anything else required is bought from him. We assume that the digger has obtained a yearly license, but if not, he can, for a small fee, get the ground he proposes to work surveyed and staked out, and, upon payment of a dollar, be entitled to work it for twelve calendar months. These preliminaries settled, the next question is plant. It is very simple. First, a number of changkols, or native hoes, must be obtained, according to the number of men it is proposed to employ. This serviceable tool becomes, in Eastern hands, the equivalent of spade, hoe, and rake—to say nothing of its uses as a weapon of offense. The next articles to be got are a sufficient number of bakols and ragas, or baskets. The ordinary earth-carrying basket is known by the former name, but the three varieties used only in mines by the latter. The changkol and raga are shown in Figs. 2 and 3. The bakols are, as will be seen, spoon-shaped, with two handles, and are made of an open-worked sort of wicker, so as to act as a sieve when lifting stones or dirt out of the mine. When the tin-bearing stratum is at-

Fig. 6, differs from it slightly in shape, and, being supported on three legs, is vulgarly known as the "Sam Kak Miao," or "three-legged cat." It derives its blast from a square wooden box, in which slides a feather piston usually worked by a boy squatted on the ground. It is not, however, invariably placed in the position shown. The melted metal pours from the furnace direct into the mould, not more than one slab or ingot of tin, as a rule, being cast at the same time. The shape of the ingot is shown below—Fig. 7. The slabs are piled in a hut, until a sufficient number have accumulated to freight a good-sized boat, when they are dispatched to headquarters.

Such in brief is a general sketch of native tin mining. Expenses have, of course, to be incurred in building attap huts for the coolies and staff, and in obtaining sufficient provisions. Riots often occur if the commissariat is not well looked after, as also on the six-monthly or annual settling days, should the coolies imagine they have been cheated of their just rights. In the main, however, the work is peacefully carried on, and many who began as day laborers have become rich men. Europeans have gone to this district, and have sent out quantities of costly machinery for the tin mining, dressing and smelting. They have, however, failed, chiefly because that which will pay on the very economical system of working adopted as described, will not pay under European systems with a numerous and expensive staff and costly machinery. The pay to native laborers is exceedingly small, and it will only be by a very careful study of the whole of the conditions and circumstances on the spot that really profitable working will be possible to Europeans by Western methods, even now that transport will be improved.

The larger illustration shows the mining village of Goping, the headquarters of the Kinta tin mining industry. A view of the mines themselves at the same place, looking from the bluff upon which the foreign houses are situated, is very similar in appearance, the build-

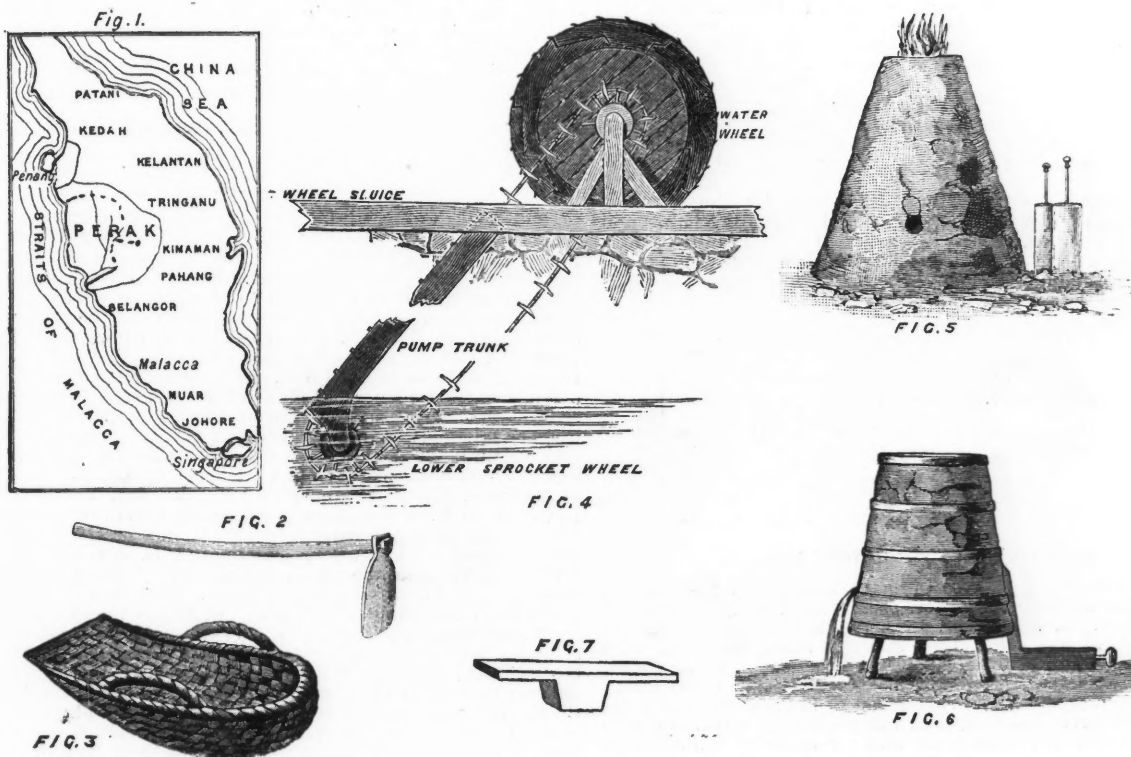
* Abstract from an article in the London "Engineer."

ings covering the pits being of the same character. The pits occupy a large portion of the level basin, surrounded on the west and north sides by hills, and on the south by rising ground, from which the views are taken.

The first section of the Kinta Valley Railroad, which has just been completed, is the beginning of a line intended chiefly to serve the tin mines. Its construction has been chiefly due to the efforts of Mr. Noel Denison, the superintendent of the district. The miners are keenly alive to the advantages of rapid and cheap transport, and the project of a railroad which could connect the principal Kinta mines with the capital—Taiping—on the one hand, and Teluk Anson, the port of Lower Kinta, on the other, was eagerly welcomed. The dotted line on Fig. 1 (which is a sketch map giving the position of Perak), shows the general course of the road, the full line showing the completed section, from the port of Teluk Anson to Tapah. From the latter town it will run to Kota Bharu, thence to Batu Gajah, the principal settlement in Kinta, and the seat of the distant magistracy and collectorship. From Batu Gajah it will go to Ipoh, an important mining town, and is eventually to be carried to Kuala Kangsa and to Taiping, the capital of the State. Taiping has already a short line of rail to Port Weld, which is the nearest port to Penang, and the outlet for Northern Perak. Batu Gajah will at present be the station for Gopong, but before long a line will connect the two places, they being only 11 miles apart. The entire line from Ipoh to Teluk Anson is to be finished by August, 1894. Considering that only native workmen and laborers were available, the speed of construction and the thorough way in which it has been carried out are creditable to Mr. Law, who

THE GEOLOGICAL SURVEY OF GREAT BRITAIN.*

Sir Archibald Geikie, Director-General of the Geological Survey, in his annual report for 1892 to the Lords of the Committee of Council on Education, states that in the prosecution of the survey of the superficial deposits in the West Riding of Yorkshire, Mr. Tiddeman has been able to improve the mapping of the carboniferous limestone and millstone grit. He has found some additional evidence in favor of the view that the Great Craven Fault, which in that region separates two distinct types of carboniferous limestone, was actually in course of formation during the carboniferous period. The small tract of carboniferous limestone at the southern end of the Isle of Man has long had a special geological interest for the remarkable group of volcanic rocks associated with it. As these rocks are well exposed along the coast, they have been carefully mapped by Mr. Strahan and Mr. Lamplugh, on the scale of 25 in. to the mile. It is in the re-examination of the great coal field of South Wales that the chief recent operations of the survey in the carboniferous system have lain. Sufficient progress has now been made to show of how much practical value a detailed survey of this coalfield will prove to be. Mr. Strahan, who has had charge of this work, soon ascertained that while the great thickness and uniformity of character of the widespread "Pennant Grit" makes it difficult to obtain indications of the geological structure over large tracts of ground, the position of a certain coal seam known as the "Mynyddislwyn vein" affords an excellent horizon from which the lie of the other strata can be followed in great detail. He has accordingly devoted special attention



NATIVE APPLIANCES AT THE PERAK TIN FIELDS.

superintended it, and the other officials concerned. The line, though a light narrow gauge, is sufficiently substantial. With a productive region to open up, and with native opinion well disposed to it, a fair measure of success should attend its future history.

Diamonds in Borneo.—It is stated that important discoveries of diamonds have been made in the Landak district of Borneo, and a company has been formed to work the mines. Sir Stamford Raffles, for some years Lieutenant-Governor of Java and founder of Singapore, wrote in 1819 of the great and rich displays of diamonds then made by the ladies of Batavia, the only mart then open for the products of the Bornean mines. Diamonds are said to be in the possession of native rajahs weighing 10, 14, 18, up to 60 carats. Landak has produced one of the largest diamonds of the world, weighing no less than 367 carats (uncut). The district of Landak is situated a few miles to the east-northeast of Pontinak, the capital of Dutch Borneo, and consists of a narrow strip of land, through which the river of the same name flows. Foreign attention has been specially attracted to three localities within the district, but the diamondiferous fields extend more widely from north to south than from east to west; and while the actual area already worked over is considerable, its size as compared to the gem-bearing district, as a whole, is inconsiderable. Landak is about three days steam from Singapore. The district is declared by experts to be not only gem-bearing, but auriferous. A large number of the diamonds already found have been taken from the beds of the streams. Under normal circumstances the gravel containing the precious particles has to be brought up by divers. But every few years—usually at intervals of five or six—an abnormally dry season occurs, and the streams become so shallow that the bed can be reached without difficulty. Both men and women engage in the work.

to tracing the outcrop of this seam, and the trend of the numerous faults which have been met with in working it. He has had occasion to examine a large series of plans of old workings, and to reduce from these the necessary data upon the 6-in. Ordnance maps. When these maps are completed, with all the available detailed information, they will probably afford a sufficient and accurate guide to the depth and dip of the various coal-seams over a large part of the area. The information thus worked out, combined with a precise geological mapping of the ground, will prevent the waste of large sums of money in seeking for coal, by showing exactly the limits within which the seams may be looked for, and the depths at which they may be expected.

In Scotland, the only new area of carboniferous rocks recently mapped is that near Campbeltown, in Cantyre, which has been surveyed by Mr. Symes, who, from his examination of the ground, and from borings recently put down by the colliery lessees, finds that the area of the coalfield is much more limited than had been hoped. The large area covered by raised beaches to the west of Campbeltown, where the coalseams might have been expected to occur, proves to lie upon upper old red sandstone and igneous rocks of carboniferous age. The new edition of the 1-in. map of the neighborhood of Edinburgh shows at a glance how greatly our knowledge of the geological structure of the ground to the west of Edinburgh has been increased by the extensive mining operations of recent years in search of oil shales. Thanks to numerous pit sections and borings, the whole succession of the lower carboniferous rocks from the base of the Hurlet limestone to the Burdiehouse limestone is now accurately known in detail, and the outcrop of the various important mineral seams, and the positions of the dislocations by which they are affected, have been put on the 6-in. maps by Mr. H. M. Cadell.

*From the "Colliery Guardian."

CARBORUNDUM.

Written for the Engineering and Mining Journal, by Wm. P. Blake.

A new abrasive material has been produced and is in the market for the various uses to which emery, or corundum, is applied. It is on exhibition in the metallurgical collection in the gallery of the Mines and Mining Building at Chicago by the Carborundum Company, of Chicago.

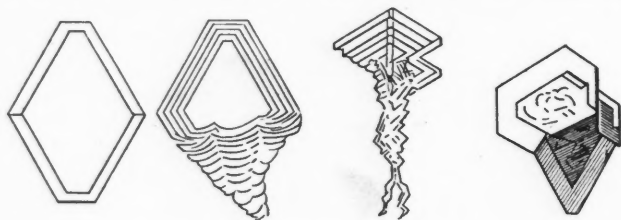
It is an artificial compound. The name which has been coined for it is misleading as to its composition, for it is not a compound of carbon and corundum, but is a definite compound, atom for atom, of carbon and silicon; a true silicide of carbon or a carbide of silicon. The name carbo-silicon would have been more scientific and appropriate, but not as useful for trade purposes.

The appearance and properties of this substance are more nearly those of the diamond than of corundum, the luster being highly vitreous and adamantine, and the hardness being extreme, sufficient in the form of a rapidly rotating wheel to cut the hardest steel and corundum crystals, and the material is said to have been used with success in polishing diamonds.

We owe the formation of this carbide of silicon to the prodigious chemical power of the electric current and the high temperature at which the carbon and silicon are brought together. The process and the apparatus are extremely simple. Carbon and silica are intimately mixed and are exposed to the force of the current in a simple trough or box made of firebrick or clay. The current flowing through the mixture reduces the silicic acid to metallic silicon, which unites with the carbon at one pole, while the oxygen passes to the other pole.

The crusts of the carbide so obtained are, on cooling, washed and cleansed in acid to remove soluble impurities, and are then crushed and sifted into different sizes to be used for making cutting wheels, whetstones or polishing cloth. The cleansed crusts of carborundum are aggregates of very small but highly brilliant crystals, with highly polished faces reflecting light like mirrors. The angles are sharp and the general arrangement or grouping of the crystals is columnar, giving the masses a rude prismatic structure made up of tabular crystals.

The industrial and scientific world is indebted for the introduction and utilization of this very important and interesting compound to Mr. Edward G. Acheson, of Chicago, who obtained a United States patent, and in June, 1891, organized a joint-stock company under the title of the Carborundum Company for its manufacture. In June,



SOME CARBORUNDUM CRYSTALS.

1892, improvements in the process of manufacture had been made; the production was increased to 25 lbs. per day, and the price lowered to \$2 and \$4 per lb. In September, 1892, the manufacture of cutting and grinding wheels was commenced and has since continued with increasing success. The present capacity of the works at Monongahela, Pa., for the production of the carborundum is said to be 100 to 150 lbs. a day. Its use at present is confined to the smaller-sized discs and wheels which have found especial use and favor with the dental profession for cutting porcelain teeth and for other uses, for which they have hitherto relied upon emery. It is claimed for the new wheels that they cut faster, are more enduring, and that they do not heat up the object being cut so much as wheels made of emery. An explanation of this may be found in the fact that the carborundum is an excellent and rapid conductor of heat, a decided advantage in many ways.

The physical properties of this substance, so far as I have been able to determine them, may be summarized as follows:

Crystallization.—Hexagonal. Generally in rhombic tabular plates, with angles of 120 degrees, and the terminal edges of the prism beveled, giving the following forms as seen, among others, in the field of a microscope, magnified about 20 diameters. The general habit is tabular, with long and irregular pedicles apparently shading off in a series of thin plates to the point of support or growth. Or, if viewed from the point of support or growth of the mass outward the thickness and regularity of crystallization increase by additional plates toward the end where the elongated irregular crystallization ends in well-formed angles and brilliant planes, often showing in very fine parallel lines upon the edges, but without any foliation. The fracture is conchoidal and there is no evidence of cleavage. The edges are replaced by minute, perfectly formed planes, and the intersection of these planes may give the appearance of striations, when viewed by transmitted light in the microscope.

Color.—As seen in mass by the reflected light, the dominant color is bluish green, but varies from a pale yellowish green to dark-blue green and emerald green. Under the microscope, by transmitted light, the thin transparent plates have a pale green tint, but the depth of color in the crystals varies, some being apparently nearly colorless or pale greenish yellow, while others are very dark olive-green, or emerald green, much like the green color shown by green tourmalines and by olivine. In some masses the color and luster are adamantine gray, a pale tint like that seen in rough uncut diamonds. A bronze-like luster may also be seen on some samples with iridescence, reminding one of the tints of newly formed crystals of bismuth. Fragments of a sapphire blue color have also been noted. When crystals are seen on edge, in a strong light, the coloring be-

comes more dense and pronounced. All the crystals appear to be perfectly transparent. When reduced to powder the coloring is lost and the fine powder is ash-gray. As seen in the manufactured wheels the pervading color is a light epidote green. I have not obtained any satisfactory evidence of dichroism, though this character is strongly suggested by the appearance of the compound. It has a high index of refraction.

Specific Gravity.—Nearly 3. One determination upon a small mass, freed from air by boiling, gave me 2.946.

Hardness.—The great hardness of carborundum has already been described, but carefully conducted tests are yet required to show its exact hardness compared with corundum and the diamond, and its exact comparative practical value as an abrasive substance compared with emery, corundum and diamond powder. It will scratch sapphire but not diamond, and its hardness is therefore between 9 and 10, or about $9\frac{1}{2}$ on the hardness scale.

Future Possibilities.—This discovery and its application are of great industrial importance. While at present the quantity of the material produced daily is comparatively small, it would seem that practically there is no limitation of the amount of this substance which may be produced. The requisite conditions are cheap power, an abundance of clean sand and of carbon, and these are not difficult to find. We may expect at no distant day to see large grindstones made of it for ordinary purposes, its superior "grit" and cutting power making it much more desirable than the sandstone of which our grindstones are made. Or we may find it molded into tire-like rims to slip upon large core wheels for economy of material and speed of mounting, with maintenance of diameter.

If by any modification of the process, by possibly slower action, and an equable high temperature, long maintained, large crystals of this compound could be formed we should have a brilliant gem added to our list of precious ornamental stones. Its fine color, splendid adamantine luster, and its hardness, all fit it to occupy a high place in the series of gems.

A TRANSVAAL COLLIERY.

The Springs Colliery lies about 28 miles east from Johannesburg, in the Transvaal, the deposits there evidently being a continuation of the measures which commence where the eastern section of the main reef series ends. The concession granted to the company includes the gift from the Government of a farm whereon coal has been proved to exist. A shaft was sunk about the middle of the farm, and at a depth of 105 ft. a bed was struck which varies in thickness from 36 to 48 ft. throughout the property. The coal is encased in layers of shale close upon 5 ft. thick, so that the bed of pure coal is of an average thickness of 39 ft. The company is now able to put coal on the market at the rate of 1,000 tons per day. The Springs Colliery is noted for its approved and admirable machinery for sizing and cleaning the coal. There is at present only one main winding shaft, which has been carried to a depth of 120 to 150 ft., exclusive of the sump. The coal seams do not lie quite flat. To the west they rise to within 90 ft. of the surface, but going eastward the measures run deeper, the quality greatly improving. One of the seams at present being worked is 21 ft. thick. The upper 9 ft. of it is a very dull coal, rather lighter than the other, but it is very much preferred on the railway, as it burns well in a draught. This suits locomotives rather better than the brighter coal which underlies the dull coal. Both are good coals and very anthracitic. There are two or three thin layers of shale, but in the whole of the 21 ft. there is not more than 5% of shale in the coal that is worked out. Above this seam, and after passing through 3 ft. of shale, there is another seam of coal 12 ft. thick. The coal hauling, screening, and washing plant is of the most modern type, and was supplied by the Humboldt Engineering Works, Kalk, near Cologne, Germany. The trucks were hauled up to an iron platform 20 ft. above the railway level, and are passed into revolving mechanical tipplers. There are two of these, besides a revolving hand tippler passing the coal over a fast screen for wet coal. The revolving mechanical tippler passes the coal over one of Briart's mechanical screens, which shakes the coarse or large coal onto a moving hand-picking belt, from which the boys pick the slate or shale, which goes into a hopper ready for transmission to the waste heap. The coarse coal is passed by the belt into a shoot, from whence it is put into bags ready for the railway trucks. The small coal passes through the screen into a hopper, whence it is taken up by an elevator, and at a higher level shot into a revolving screen. This revolving screen is so contrived that it divides the small or nut coal into three sections, and passes the waste into a hopper for transmission to the waste heap. The three sizes of nuts are passed through separate shoots into separate washing machines, through which clean water is passed, and the slate is separated from the coal, which latter is passed through a shoot into a screen, which carries the coal, minus the water and mud, into a hopper; it then goes into a measuring box, and so into bags ready for the railway trucks. The slate and water pass down through pipes into an iron hopper. An elevator with perforated buckets separates the slate from the mud and water. The slate is passed into a hopper ready for the waste heap. The water and mud from all parts, from the coal as well as from the slate, are passed through pipes to a receiving tank. An elevator with perforated buckets takes the mud from this dirty water, and passes it into a mud hopper ready for the waste heap. The water thus made clean is pumped up from the tank by a centrifugal pump to the washing machines, and thus the water is used over and over again. The waste in a ton of coal at this colliery by the present process is only 10%, being 5% slate and 5% fine or dust coal. A German analysis of Springs coal gives: Carbon, 67.3%; hydrogen, 3.4%; oxygen and nitrogen, 7.3%, and ash, 22%. The machinery throughout has cost upward of \$225,000, making the total amount expended by the Netherlands Railway Company on the Springs Colliery, including the cost of the farms and all the buildings erected, upward of \$450,000.

THE SHALE WORKS OF SCOTLAND.

By James Constable.*

Shale mining and its related manufacturing industries have become one of the most important of the industries of Scotland, the total capital of nine incorporated companies being over \$10,000,000. The shale mines lie principally in the counties of Edinburgh and Linlithgow. The seams belong to the calciferous sandstone series which underlie the lower coal measures. The Raeburn shale seam, which averages from 2½ ft. to 3 ft. in thickness, has only been worked to a very small extent. The method adopted has been on the longwall principle. The next in order is the Mungie shale. Its average thickness is about 30 in., but it has been little proved by workings. About 24 fathoms below this shale lies the two-foot coal, the position of which is, however, sometimes occupied by a seam of blackband ironstone and a shale about 18 in. thick. No workings have been carried on in this, but the upper portion of the shale is said to be of fine quality. From about 34 to 50 fathoms below this lies the grey shale, which has only been worked to a small extent in the West Calder district, where it was found to be about 24 in. thick. In the refining processes it produced a large percentage of solid paraffine. From the grey shale to the Houston coal the distance varies from 10 to 14 fathoms. This coal has been mined by several of the oil companies on their leaseholds, but so far with little success. Only in some districts indeed has it been found workable, and even there the expense was great, owing to the soft nature of the roof and pavement. After this comes the Fells shale, which underlies the coal from about 30 to 40 fathoms. This seam has proved the most important. It has been worked principally by the longwall method. There are two qualities of shale in the seam. The yield of oil from the top or good portion is about 36 gal. per ton of shale, and from the lower about 18 gal., while the yield of ammonia is from 20 lbs. to 30 lbs. per ton. This is really the richest of the shales as regards the yield of oil. The next lower shale is the Broxburn shale, which averages 5½ ft. in thickness. The quality of the shale varies considerably in different districts. In some cases the yield of oil is as low as 16 to 20 gal. of crude oil, while the sulphate of ammonia is about 40 lbs.; in others again the oil increases to 35 gal., with the ammonia about 25 lbs. per ton of shale. The Dumfries shale seam, which underlies the Broxburn at a depth varying from 45 to 70 fathoms, is from 6 ft. to 16 ft. thick. The yield of oil from the Dumfries shale is from 15 to 30 gal. and of ammonia 20 lbs. to 40 lbs. per ton. The Barracks shale, which comes next, has not been worked to any large extent. The average thickness is about 10 ft. Almost immediately below this shale lies the Camps limestone, although in one case the distance, as proved by boring, was 100 fathoms. From the Camps limestone again nothing is got until the Pumphreeston shales are reached, some 120 fathoms below. These shales consist of five seams lying comparatively near one another, and are as follows: No. 1, or Jubilee shale, about 8 ft. thick; No. 2, or Maybrick, about 6 ft. thick; No. 3, or Curly, about 6½ ft. thick; No. 4 or Plain, about 8½ ft. thick; No. 5, or Wee, about 4½ ft. thick. And yet these seams have only been wrought on three properties. The winding inclines are generally driven in Nos. 3 or 4 seams, and level cross-cuts driven to win out the others. The average inclination is 1 in 1½. The workings have been entirely by the stoop-and-room method, rooms being about 12½ ft. wide, and the stoops from 20 to 30 yards square. Stooping has been carried on to a small extent. The yield of oil from these shales is comparatively small, being only about 20 gal. per ton, but this is made up for by the yield of ammonia, which is as high as 60 lb. to 70 lb.

Coal Mines of Wang-san-shih, China.—At this place there are three seams of 24 ft., 3 ft. and 14 ft., the dip of which is at an angle of 50° nearly due south. A perpendicular shaft has been sunk 106 ft. with no fault. The first 25 ft. were through alluvium, thence through quartzite, and a few bands of shale in quartzite. The shaft is being deepened at the rate of 4 in. an hour. Wang-san-shih is only three miles from the line of railway and six miles from the iron mines. In summer a creek comes within half a mile of the works, and it was up this that the heavy machinery was brought to the mines, by the following ingenious process: A raft, drawing only an inch to the ton, was constructed, and the machinery being shipped, was dragged up the creek till it grounded; then a dam was built behind, which caused it to float, and this was successively and successfully done until the machinery was got to within half a mile of the mines. Hand portage took it the rest of the way. The coal put out so far improves as it goes down, and is of excellent quality, but it unfortunately will not coke.

Quicksilver in Colombia.—In a note presented to the North of England Institute of Mining Engineers, Mr. Edward Halse says that a vein of cinnabar was discovered in 1786 near Quindiu. In 1886, special search was made for the rediscovery of the old mines, and consequently six levels, together with various furnaces, tools, etc., were discovered. The mine is nearly 10,000 ft. above the sea level. The formation in which the cinnabar occurs consists of chloritic, talcochloritic, arenaceous and aluminous schists of Palaeozoic age. At the foot of the mountain there is a mass of dioritic porphyry forming the bed of the river Bermillion, while near the summit of the mountain there is a large dioritic dyke. The average percentage of cinnabar in the veins and seams varies between ½ and 1½%. It is not improbable that more valuable deposits occur in the mountain and near the large dioritic dyke, which is considered to traverse the hill. The Quindiu deposit may be regarded as impregnations, probably intimately connected with the intrusive dioritic dyke. Heated waters bearing double sulphides of iron and mercury in solution may have made their way up and along this disturbance, and then passing between the bedding planes of the softer schists may have impregnated beds occasionally filling joints and the fissures therein.

* Abstracted from article in the "Journal" of the British Societies of Mining Students.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of New York.

When Examination of Party Before Action is Proper.

Where there is a doubt as to who were owners or operators of a mine at the time of an accident therein at which decedent was killed, decedent's administratrix is entitled to an examination of the superintendent of the mine, before bringing action for the death of decedent, to ascertain such fact. (In re Nolan. 24 N. Y. Supp., 238.)

Court of Chancery of New Jersey.

Rescission of Sale for Fraud.

A sale of mining property will be rescinded where complainant purchased relying on the representations of the owner as to its quality, which were false, and the owner, from his personal experience, could have known whether they were true, and complainant could not have ascertained from the examination he was able to make whether they were true or not. (Burrows versus Wene. 26 At. Rep., 891.)

PATENTS PUBLISHED IN GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

WEEK ENDING AUGUST 26TH, 1893.

- 8,467 of 1892. Extraction of Zinc from Complex Ores. H. R. Lewis, London, and C. Gelsiharp, Newcastle.
- 14,147 of 1892. Extraction of Gold from Refractory Ores, by passing the ores into a bath of Molten Lead. F. W. Durham, London.
- 16,297 of 1892. Soldering Aluminum. O. Nicolai, Wiesbaden, and C. Langenbach, Frankfurt, Germany.
- 9,817 of 1893. Extracting Zinc from Zinc Lead and other Complex Sulphides. W. R. Ingalls and F. Wyatt, New York.
- 12,869 of 1893. Lighting Miners' Safety Lamps. H. Freise, Bochum, Germany.
- 12,870 of 1893. Magnetic Fastening for Miners' Safety Lamps. H. Freise, Bochum, Germany.
- 12,931 of 1893. Improvements in Metallurgical Furnaces. C. James and W. Griffiths, Swansea.
- 13,038 of 1893. Crushing Mill. R. MacCully, Philadelphia.
- 13,117 of 1893. Production of Metallic Chromium, Manganese, Molybdenum, Titanium and Tungsten. A. Sternberg and A. Deutsch, Berlin.

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:

TUESDAY, AUGUST 15TH, 1893.

- 503,134. Rolling Mill. Henry J. Gosling, Philadelphia, Pa., Assignor to George Barnett and Henry Barnett, same place.
- 503,140. Apparatus for Purifying Water. John J. Hoppes, Springfield, O.
- 503,156. Stone-cutting Machine. Alexander McDonald, Cambridge, Mass.
- 503,159. Soldering Machine. Frank H. Palmer, Brooklyn, N. Y.
- 503,162. Wire-harbing Machine. John S. Reid, London, Eng.
- 503,179. Converter. Charles Vattier, Paris, France.
- 503,194. Forge Tray. Rufus S. Burnett, Dallas, Tex.
- 503,220. Apparatus for the Manufacture of Glass Bottles. Barnard A. Spaul, London, Eng.
- 503,227. Wire Rope Drum Reel. Arthur D. Benham, Chicago, Ill.
- 503,241. Apparatus for Rolling Sheet Metal. John Jenkins, St. Louis, Mo., Assignor of one-half to the St. Louis Sampling Company, same place.
- 503,250. Earth-loading Machine. Joseph Oppold, Grant, Ia.
- 503,273. Mass. Claude A. P. Turner, Ashton, R. I., and Philip A. Warner, West Newton, Mass.
- 503,286. Process of Making Carbonic Acid. Eduard Luhmann, Andernach, Germany.
- 503,337. Pyrometer. Edward A. Uehling and Alfred Steinbart, Birmingham, Ala.
- 503,364. Car-loading Apparatus. Darwin C. Boyce, Quinamont, W. Va.
- 503,381. Conveying Apparatus. Thomas S. Miller, South Orange, N. J.
- 503,409. Apparatus for Piling Coal. James M. Dodge, Philadelphia, Pa., Assignor to the Dodge Coal Storage Company, same place.
- 503,423. Manufacture of Glazed Iron. John W. Kidwell, Washington, D. C.
- 503,424. Manufacture of Pigment or Paint. John W. Kidwell, Washington, D. C.
- 503,429. Process of Producing Chlorine and Purifying Lead. Farnham M. Lyte and Cecil H. M. Lyte, London, Eng.
- 503,439. Coal Chute. John F. Schmaderke, Brooklyn, N. Y.
- 503,454. Ore Separator. Robert Dilworth, El Paso, Tex.
- 503,494. Portable Furnace. Robert Reach, Philadelphia, Pa.
- 503,556. Apparatus for Treating Pulverulent Materials with Gases. Ernest Solvay, Brussels, Belgium., Assignor to the Solvay Process Company, Syracuse, N. Y.
- 503,557. Apparatus for the Distillation of Hydrochloric Acid. Ernest Solvay, Brussels, Belgium, Assignor to the Solvay Process Company, Syracuse, N. Y.
- 503,558. Treating Pulverulent Material with Gases. Ernest Solvay, Brussels, Belgium, Assignor to the Solvay Process Company, Syracuse, N. Y.

TUESDAY, AUGUST 22D, 1893.

- 533,583, 503,584, 503,585, 503,587. Process of Making Smokeless Explosives. Francis G. Du Pont and Pierre S. Du Pont, Wilmington, Del.
- 503,607. Mining Machine. Francis M. Lechner, Columbus, O.
- 533,616. Relling Machine. Benjamin F. Peacock, Anniston, Ala., and Francis T. Peacock, Sparrow's Point, Md.
- 503,651. Artesian Well. Robert J. Chipman, Paterson, N. J., Assignor of one-half to Cyrus P. Cramer, same place.
- 503,655. Hydraulic Dredger. Charles E. Ellicott and Francis Ellicott, Lake Road, Md.
- 503,687. Ore Concentrator. Charles E. Seymour, Lake Geneva, Wis.
- 573,732, 503,733, 503,734. Dredger. Lindon W. Bates, Chicago, Ill.
- 503,765. Amalgamator. Joseph S. Johnson, San Francisco, Cal.
- 503,783. Pot for Molten Metal. Charles Bush, Newburg, N. Y.
- 503,800. Conveying Apparatus. Thomas S. Miller, South Orange, N. J.
- 503,801. Composition of Matter for Tempering. Johan E. Mills, Chicago, Ill.
- 503,816. Process of Manufacturing Steel. Charles Walrand and Eugene Legenisel, Paris, France.
- 503,819. Hydraulic Air Pump. Edward H. Weatherhead, Cleveland, O.
- 503,830. Rolling Mill Plant. Leroy Cook, Worcester, Mass.
- 503,839. Method of Treating Refractory Ores. Charles J. Fauvel, London, Eng.
- 503,847. Apparatus for Making Sulphuric Acid. Francis B. Hacker, Charleston, S. C., and Peter S. Gilchrist, Baltimore, Md., Assignors to themselves and Albert C. Johnson, Baltimore, Md.
- 503,894. Billet Conveyor for Rolling Mills. Seward S. Babbitt, Pittsburgh, Pa.
- 503,900. Process of Making Aluminum Fluosulphate. Willard E. Case, Auburn, N. Y.
- 503,901. Process of Making Aluminum Compounds. Willard E. Case, Auburn, N. Y.
- 503,926. Furnace for Welding, etc. Robert J. Buck and Chester J. Buck, Bridgeton, N. J.
- 503,929. Method of Producing Aluminum. Joseph B. Hall, Wheeling, W. Va.

PERSONALS.

Dr. Walter P. Jenney has been elected dean of the Dakota School of Mines, at Rapid City, S. Dak.

Mr. G. de la Boulglise, mining engineer, and president of the Rosebud Milling Company, of Cripple Creek, Colo., has left that camp for his home in Paris, France.

Mr. H. L. Shaffer, manager of the Adelaide Copper Mining Company, of Pierceville, Ga., is spending a few weeks in Chicago. His address there is the Great Eastern Hotel.

Mr. R. F. Learned, of Natchez, Miss., is now in Chicago. He is interested in the Tennessee Coal Iron and Railroad Company and the Camille Gold Mining Company, of Tallapoosa, Ga.

Mr. George W. Stuart has resigned the management of the Truro Gold Mining Company, Nova Scotia. It is stated that the property will be sold some time this month to effect a reorganization.

Mr. J. Wm. Smith, manager of the soda ash department of the Solvay Process Company, of Syracuse, N. Y., is in Chicago, looking over the exhibits at the Fair. His address while there will be the University of Chicago.

Mr. Harry T. Cory has been elected professor of civil engineering at the University of the State of Missouri. Mr. Christian W. Marx has been elected to the chair of mechanical engineering, and Mr. William Shrader to that of electrical engineering, at the same institution.

The Salt Lake City "Mining Journal," which has favored the "Engineering and Mining Journal" from time to time with outbursts of venomous vituperation because it did not like our views on the silver question, has contracted itself from a daily to a weekly publication, and has changed hands, being now the property of W. A. Graves. We hope the change will improve its manners.

OBITUARY.

Michael Schall died in York, Pa., on August 31st, aged 65 years. He was heavily interested in the Wrightsville (Pa.) Iron Works and the Columbia (Pa.) Rolling Mill.

Richard Gluyas, superintendent of the Hot Creek & Rattlesnake Mining and Milling Company, Hot Creek, Nye County, Nev., committed suicide about a fortnight ago. He personally owned considerable mining property.

George Bowes, a well known mining man, was found dead on his ranch, near Elizabeth, Colo., on the 28th ult. He had gone out into the fields in the morning, and it is supposed he dropped dead from heart disease. Mr. Bowes was superintendent of a mine at Leadville up to within a short time ago, when the property shut down.

Ernest V. Clemens, superintendent of the De La Vergne Refrigerating Machine Company, died in New York City on the 3d inst., aged 38 years. He was a mechanical engineer of marked ability. He designed mining machinery, converters, iron, brass, copper and grain rolling machinery, and superintended the erection of mills and foundries in various sections. He was a member of the American Society of Mechanical Engineers, and the American Society of Civil Engineers.

Dr. Robert A. Lamberton, president of Lehigh University, died suddenly at South Bethlehem, Pa., on the 1st inst. He was born in Carlisle, Pa., in 1824, and was graduated at Dickinson College, being valedictorian of the class of 1843. He was admitted to the Dauphin County bar in 1846, and rapidly rose to distinction in his profession. When the rebellion broke out he became lieutenant-colonel of the First Regiment, Pennsylvania Militia, and in 1873 he was elected a delegate-at-large to the Constitutional Convention, where his commanding ability and grasp of constitutional law immediately asserted itself. He continued in the active practice of the law until 1880, when he was elected to the presidency of Lehigh University, after the resignation of Dr. Henry Coppee. The University of Pennsylvania conferred on him the degree of Doctor of Laws. President Lamberton found Lehigh University in 1880 with 200 students enrolled on its register. The institution now has 631 students and 37 professors, and takes rank with the best technical and general colleges in the country. President Lamberton has been a director of the Lehigh Valley Railroad, trustee of the Asa Packer estate, trustee of the Packer estate and trustee of St. Luke's Hospital, Bethlehem.

SOCIETIES AND TECHNICAL SCHOOLS.

The Federal Institution of Mining Engineers, of Great Britain will hold a general meeting in Scotland this week. This includes the summer meeting of the Mining Institute of Scotland. The papers which are to be read are unusually interesting.

The Lake Superior Mining Institute has decided to cancel the meeting which was to have taken

place on September 3d, as the business interests throughout the several iron mining districts of the Lake Superior region are in such a poor condition.

The University of the State of Missouri begins the session of 1893-94 with three professors of engineering, and two new buildings at Columbia, Mo. The Engineering Building proper has a front of 145 ft. by a depth of 78 ft., and contains 32 rooms, in addition to two large lecture halls. Fifty feet south of it stands the Mechanic Arts Building with 108 ft. front by a depth of 117 ft. It has six shoprooms, an exhibit hall, two offices, an engine-room, storerooms and a beautiful drawing-room. The power is furnished by a 75-H. P. Corliss engine. Instruction is given in this building to students in the College of Agriculture and Mechanic Arts, and to others also; but all the engineers work in it several times a week. It is as much at the service of this department as if it were used exclusively for engineering. The equipment of these buildings in tools, instruments and other appliances for work is all new, and is worth at least \$15,000. This gives the department a good start. The equipment of this department will be increased as the means of the university permit.

A new \$20,000 building will soon form an important addition to the Colorado School of Mines, at Golden, Colo. The plans have been drawn and are now ready for inspection. On the 14th inst. the Board of Trustees will meet to receive bids for its construction. The new building will be of brick and stone and will be three stories in height, including a large basement. It is named the "hall of engineering," and civil engineering, mining engineering and electrical engineering will be taught there. The student will be aided in his work by the latest and most improved practical models and appliances. The school will open upon the 18th inst., with a probable attendance of 115 students. The faculty of the institution has been rearranged. Prof. R. Chauvenet still remains its president. Prof. G. C. Tilden will occupy the chair of analytical chemistry, Prof. Paul Meyer that of mathematics, Prof. L. C. Hill of electrical engineering, Prof. E. B. Kirby of metallurgy and mining, Prof. W. S. Hall of engineering, Prof. H. S. Patton of geology and mineralogy and Prof. W. W. Cummings that of adjunct professor in engineering. The new men are Professors Kirby, Hall, Patton and Cummings, of whom mention was made in our last week's issue.

INDUSTRIAL NOTES.

The Malleable Iron Works, of Toledo, O., resumed on the 5th inst., employing 300 men.

It is announced that all the departments of the Pennsylvania Steel Works, at Steelton, Pa., have resumed operations, giving employment to about 2,000 men.

The Lochiel rolling mill, Harrisburg, Pa., in which work was suspended a few months ago as the result of the shutdown of the Middletown Tube Works, will resume on October 1st.

The mills of the Lebanon Iron Company, Lebanon, Pa., shut down temporarily on the 1st inst. It is not known how long the suspension will continue. Three hundred men are thrown out of employment.

No. 6 blast furnace, of the Bethlehem Iron Company, South Bethlehem, Pa., went out of blast on the 1st inst. Only two of the company's furnaces are now in blast, the one at Lucy Furnace and one in Bethlehem. A number of the labor gangs have been laid off and others reduced in number. Between 1,400 and 1,500 of the company's employees are now idle.

According to the latest advices from Pittsburg, Pa., there are now in that district 25 mills and iron plants in operation. The number of entire idle plants is 17. Compared with the same time last year, there is not much difference. While there are more plants in operation now, three of the largest—Carnegie's, at Homestead, Thirty-third and Twenty-ninth streets—were crippled this time a year ago. These three plants now being in full operation, increased the number of employed between 7,000 and 8,000, which will offset the idleness of at least 10 smaller plants.

The National Tube Works Company, at McKeesport, Pa., resumed operations on the 4th inst., in another puddling department, comprising 22 furnaces, and the continuous rolls of the finishing department resumed on the following day. Three furnaces of the Butt weld department have also started again and a few men have been placed at work in the yards of the blast furnace plant of the same company loading pig iron for shipment. These departments have been closed from 4 to 10 weeks. About 2,000 men are now at work in the plant, where only 50 were employed three weeks ago.

Reports from Pittsburg continue encouraging, so far as the iron and steel trades are concerned. All the departments of the Black Diamond Steel Works are running double turn except the large hammer department, which will also go on double turn next week. The 16-in. or bar mills of the Oliver Iron and Steel Company and part of the Hainsworth

Steel Company's plant resumed operations on the 4th inst., with non-unionists. Manager Oliver claimed the new men in both plants were experienced and were turning out good product. About 500 men are at work in the Hainsworth and 100 in the bar mill. Two hundred additional men have been given employment at the steel plant of Howe, Brown & Co. The mill is controlled by the Amalgamated Association and has a special wage scale. The rod department of the Braddock Wire Company started up in full. Nearly 200 more men, who have been idle several months, were put to work. The Liggett Spring and Axle Works, of Lower Allegheny, resumed operations, giving employment to several hundred men. The works have been idle over a month. The stove foundry of the Anschutz-Bradbury Company, which closed down nine weeks ago, resumed, giving employment to about 175 men. The stove foundry of De Haven & Co., Limited, will start up again; nearly 100 men will be employed. Carnegie's Steel Works started up and all departments are now working. Over 2,000 men who have been idle returned to work. The converting and 23 and 28-in. mills, which have been closed for two weeks, were put on double turn. The 40 and 35-in. mills will run single day turn while the 33-in. mills started on the 4th inst on single turn. The 32 and 119-in. mills, which have been running single turn, will continue so. The armor-plate shops and machine shops will work both turns. The prospects for the continued operation of the plant are now better than they have been at any time since the financial depression affected the iron industry. At the United States Iron and Tinplate Works, at Demmler, Nos. 1, 7 and 8 sheet mills have resumed, and one heating furnace and one shop furnace have been put on. About half the Demmler works are now running. Within another week nearly all the National Tube Works Company's plant, it is expected, will be in operation again. The Beaver Falls Rod Mill, of the Carnegie Steel Company, has resumed in full, putting 150 men to work.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GENERAL MINING NEWS.

ALABAMA.

Franklin County.

The Yountree ore mine and the Russellville coal mines, which suspended about two months ago, will resume operations on the 11th inst. on full time. About 2,000 men will be given employment. The mines have contracts enough ahead to run the mines night and day for six months.

ARIZONA.

Maricopa County.

Columbia Gold Mining and Milling Company.—This company is developing a property near the old Gunsight mine, south of Gila Bend. A shaft has been sunk 40 ft., and from this level a drift of 14 ft. long has been made through a solid body of ore. The vein widens as the drill penetrates it, and no wall has yet been encountered.

Pima County.

Reports from Tucson are to the effect that the gold mines of Pima County are coming into prominence. A group of them was recently bonded for \$30,000. In the neighborhood of Arivaca developments are very encouraging. The Santa Catalina Mountains are attracting more and more attention.

Mammoth Mining Company.—It is said that this company's mill will start up ere long with 100 stamps. The present power will be used to run the Raber mill on the tailings, while the pulp from the new stamps will be worked by the Raber process.

Vekol.—It is stated that there is a likelihood of this mine, 35 miles from Casa Grande, being started up under a lease. It is a part of the John D. Walker estate, and was closed down during litigation, but the case is now settled. Ore, estimated at \$150,000, now lies on the dump, while the machinery and buildings are all in place to resume work.

Yavapai County.

The Big Bug district is the foremost camp in northern Arizona at present. Within a radius of six miles are the McCrum sampler, the Willschaft quartz mill, the Commercial Mining Company's smelter, at the Boggs, the Henrietta Company's mill and the Pratt mill. John S. Jones' mill is also in the district. All these are working actively.

(From an Occasional Correspondent.)

Probably no section of the mining regions is any less disturbed by hard times than this county. The low price of copper has not made much reduction

How

in the labor list at Jerome, nor at the Boggs mine, nor is there any present appearance that a reduction will take place.

The mining of silver ores ceased last year, and although a few chloriders, who were able by occasional shipments to gain a good livelihood, have been driven to the wall by the low price of silver, still most of them have turned to hunting gold with good effect.

The two largest precious metal mines of the county, Congress and Seven Stars, are still idle, the former waiting for the approach of the North & South railroad, and the latter for reasons well known to the readers of the "Engineering and Mining Journal." The next on the list is the Yarnell, in the Weaver District. Their 20-stamp mill is running continuously and late developments in the mine in a lower tunnel level are of a favorable character. Very careful and extended tests are being made upon the question of chlorinating the base ore, and satisfaction is expressed at the results. Should such an addition be made to their works it will be of great advantage to the whole county, as it will, no doubt, end in establishing it at other points where it is much needed. Perhaps a still better plan would be the erecting of a chlorination plant at some central point for all the auriferous pyrites of the county.

A 10-stamp mill has been placed at Weaver Gulch, near Stanton, and is now ready to run. There is a strong vein $2\frac{1}{2}$ to 6 ft. wide at this point, and should the mill do good work it will prove a paying enterprise, as there is gold in the ore. Many good gold mines are known in the Castle Creek and Lower Hassayampa (Black Rock) districts, but so far only one party has shown enterprise to start a five-stamp mill. It will soon be ready to run—I say enterprise, but it is hard to show that quality without any funds to start with, and that trouble prevents a good deal of energy in such places. Law and similar influences are keeping mines in the Bradshaw district idle, but we hope soon to report better results at that section.

The cheerful and lively district of the county is the Chaparral, or Galena Gulch, some 18 to 20 miles east of Prescott. It is singular how sections become mis-named, as this one, for example. I cannot learn that Galena Gulch has ever produced any galena, but from the first work done in that section it has been known as gold-bearing, and now we know that the gold-bearing veins are freer from other bases except iron than any other section of the county.

There are now four mills running in the vicinity. Three of them have five stamps each and the fourth a small-sized Huntington, and a fifth of five stamps is being built by Packard & Wells, which will be running in a fortnight. These mills are running on ore which yields from \$10 to \$60 per ton in free gold and producing concentrates which go from 8 to 10 oz. per ton. Little is handled that yields less than \$20 per ton. They all have more work than they can do. Most of the veins worked were found previous to this year, but lately three additional "finds" have been made and development work in them is going rapidly forward. Work has been commenced on a 20-stamp mill by a new company, which has purchased a group of claims. This company showed the usual "tender-foot" wisdom of making a contract for a "patent" machine, but has happily been stopped and brought back to the "old reliable" method.

Taken altogether the camp is a lively one, and the men are getting good results for their labors. The section has a great future before it. It is not necessary to refer to the individual claims, for all are doing well, and are more to be judged by the amount of work done than from the quality of the different veins.

Some very valuable discoveries have been made of gold veins in the Santa Maria country, on the west side of Kendrick Mountain, but at present the discoverers are engaged principally in "blowing"; they will get to work after a while. The assays run high and the veins are large. What percentage of free gold the ores carry has yet to be determined. So far as I have seen they have no bases but iron sulphurets. One fact is fixed, and that is all veins so far run to sulphurets. That is, however, no drawback, as the results of chlorination in South Dakota have been so very successful that all such difficulties have been removed.

CALIFORNIA.

Amador County.

Alma Gold Mining Company.—This company has been incorporated for the purpose of developing the Mattley field claim, near Jackson. The capital stock is \$1,000,000, divided into 200,000 shares of \$5 each. The directors of the company are Geo. B. Hazleton, president; J. N. Wells, vice-president; D. Gutman, secretary; W. B. Hamilton, H. H. Bodwell and J. B. Francis. Mr. Francis is the superintendent. The company has put several men to work.

Butte County.

Standard.—The owners of this mine, at Oregon City, will shortly begin the erection of a new mill, says the Oroville "Register." The shaft is now down 240 ft. and 15 men are employed.

Mono County.

Bulwer Consolidated Mining Company.—Ore of fair grade continues to be extracted from this

mine. The Bodie mill has begun to crush this ore, of which there is now quite an accumulation.

Nevada County.

The mining interests of Grass Valley district seem to be more prosperous than for some years past. Twenty-five mines and prospects are being worked within a radius of three miles, and most of the developed mines are working full forces of men, and on a good grade of ore.

Lone Jack.—The pump at this mine, in Grass Valley, has been started. The shaft will be sunk to the 1,500 level and the ledge opened at that point.

Norambagna.—A clean-up of 28 loads of ore has just been made at this mine, in Forest Springs, which yielded \$27 to the load.

Utica.—The product of this gold mine, which is owned by Alvinza Hayward, the W. S. Hobart estate and Charles Lane, will, it is estimated, be about \$130,000 for August. In July last the mine produced about \$128,000. Additional strikes of ore were made during August.

Plumas County.

Centennial.—This mine, located in Genesee Valley, has been purchased by T. K. Stewart, R. E. Moore, Louis Dean and A. G. Fletcher. The consideration is not known. It is a gold mine and there are now a 10-stamp mill and two arrastras on the property.

COLORADO.

The Denver "Republican" says that the Pueblo smelters are receiving a sufficient quantity of ore to keep them running so long as the present receipts keep up, and that there is no intention of closing either on account of the action of Congress or for the want of ore. They expect the supply to increase considerably during the next few weeks.

Colorado Fuel and Iron Company.—The report of this company for the eight months ending June 30th says all but \$11,780 of the Denver Fuel indebtedness has been paid off. The company negotiated time loans of \$1,000,000 to secure working capital and for improvements, and, when the market will permit, general mortgage bonds will be sold to pay them off. Business has been fair considering the times. Net earnings after all charges and preferred stock dividend were \$362,509, or about 4% on the common stock, equal to 6% per annum. The cost of production at Pueblo has been materially reduced and the works can compete with others so as to yield a fair margin of profits. The curtailing of silver production will, of course, have effect on earnings, but the company has large business outside of what comes to it from the silver industry.

Clear Creek County.

Shipments are being made from Idaho Springs by the Kitty Clyde, Lexington, Lake Tunnel, Casino, Ashland, Gold Eagle, Ready Cash and Morning Star mines. The Idaho Springs "News" reports that placer mining in the vicinity is growing in popularity.

El Paso County.

The Cripple Creek "Crusher" says of the mines at that camp: The Blue Bird shaft is now down nearly 200 ft. and the vein is widening. The ore from the bottom is a fair grade, which amalgamates well and the refractory ore concentrates to a high per cent. Regular shipments of high grade are made to the smelters. At the Victor, all parts of the mine are producing ore. On account of muddy roads no shipments were made the last week. One hundred and twenty tons of third-class ore will be sent to the smelters this week. A sample carload of this ore sent to Denver last week returned \$37 per ton. At the Rosebud 45 stamps are at work. Excavations for the new chlorination plant at the south end of the mill have commenced. At the cyanide mill a clean-up is being made.

Work Mining Company.—The Morning Glory mine is showing up well, says the Cripple Creek "Crusher." The north drift from the bottom of the winze is now in 40 ft., and for over 30 ft. has been in ore that shows plenty of sylvanite. This ore is directly under the chute, discovered last week, in the bottom of the main drift, and insures 100 ft. of good stoping ground.

Lake County.

The Maid of Erin resumed operations on the 1st inst., with a force of 40 men. The Penrose, it is understood, is contemplating resuming soon. The Little Johnnie is making steady shipments of gold ore, some of which is reported to be rich.

(From our Special Correspondent.)

It is learned on reliable authority that the American Smelting Works, the second largest in the camp, and owned by the Chicago & Aurora Smelting and Refining Company, will close down entirely during the week. No ore has been purchased for some weeks, and the bins are fast being emptied. Over 400 men will be thrown out of employment by the shutdown. Of six smelting concerns located here in Leadville, only the Bi-Metallic will be running after the 10th, and even this is only cleaning up the ore now on hand.

The El Paso shaft has been entirely unwatered, thus completing one of the most successful and important enterprises ever inaugurated in this camp. This work was begun last March and consisted of the drainage of the entire eastern sec-

tion of Fryer Hill. The territory to be drained was so large and the accumulation of water of such long standing that it was at the time predicted that the project would only result in disaster. To-day the entire territory is drained, the ore bodies have been opened up and shipments have been commenced. Ore shipments from this section are now being made from the Tip Top, Cora Belle and Forepaugh, while the Olive Branch workings are being cleaned out. The ore in the old stopes is a sulphide and runs fairly well in silver. It is not the intention of the management to do much work at present.

There are 45 men employed on the several White Cap leases. On the Comisky a streak of gold ore 10 ft. wide has just been opened up running from $\frac{1}{2}$ to 2 oz. in gold. In the Kane lease a new body of carbonates 4 ft. in width has been opened up.

A deed was filed with the county clerk this week by Thos. K. Maree, of New York, as receiver of the Fitzhugh Consolidated Mining Company, transferring to Thos. Chaffey, of Brooklyn, the Fitzhugh lode, in California mining, and the Trafalgar lode, in the Graphite mining district. Consideration, \$500.

Belden.—This mine, on Battle Mountain, is now employing 120 men and shipping 60 tons daily. The ore is a carbonate averaging 47% lead, 16 oz. silver and 3-10 oz. gold, 15 to 20% iron excess. The workings show a breast of this ore 25 ft. high. A good strike has just been made in the St. Joe, adjoining the Belden, and owned by ex-Governor Grant et al. A body of ore is disclosed similar to that in the Belden, but running 69% lead.

Boreel Mining Company.—The lessees of this company are working through the Emmett shaft and taking out 50 tons a day of a good grade sulphide.

San Juan County.

The following items of Silverton mining news are taken from the local papers: The Silver Lake mine is working about 130 men on high-grade ore and shipping regularly a car of concentrates daily. The North Star, on Solomon Mountain, works about 30 men, shipping regularly to the Crook refinery, in Silverton. The North Star, on Sultan Mountain, is working about 35 men and taking out large quantities of ore. The Iowa mine is working 12 men, taking out high-grade ore, running from 3 to $7\frac{1}{2}$ oz. of gold to the ton and 50 oz. silver, and on the opposite side of this vein, 37 ft. away, is a lead streak over 2 ft. in width, 35% lead and 18 oz. silver. This mine will be a constant shipper from now on. The gold and silver ore, 10 ft. in width, was only discovered last week.

William Feigel has made a recent strike on Alhambra that gave assay returns of \$147.55 of gold and 63.25 oz. silver per ton. This mine is located on the divide near Bridal Veil Basin, and on the old trail from Silverton to Bridal Veil. The Green Mountain mine, in Cunningham Gulch, is working 15 men, and shipping 100 oz. ore from a 22-in. vein, and will keep it up all the year round.

San Miguel County.

Shipments of ore and concentrates from Telluride for the two weeks ending September 1st were as follows: Smuggler-Union, 715 tons; Hector, 22 tons, and Crown Jewel, 11 tons. Total shipments since January 1st aggregate 13,636 tons.

Smuggler-Union Consolidated Mining Company.—The tunnel starting from the Bullion is now in 2,300 ft. and has entered the Union ground. It will be steadily advanced through both the Union and Smuggler. Manager Mansfield informs the Telluride "Republican," that the Sheridan mill will be started this week and will concentrate about 100 tons per day.

Summit County.

Several plants for the working of gold claims have recently been put in near Breckenridge, and tests so far are said to be successful. Gold mining is already replacing the silver workings, and most successfully. Considerable retort gold has been shipped from there during the past summer, and the work will continue all the coming winter.

IDAHO.

Ada County.

The De Lamar "Nugget" says: Mr. Anchor, who went East some time ago to dispose of a quantity of opals from the mines in which he is interested, is reported to be meeting with success. One large stone taken with him has been valued at \$3,000. He and Mr. Fleming, of Nampa, are now in Chicago, negotiating the sale of a number of the principal claims to capitalists.

INDIANA.

Sullivan County.

At Shelburn, on the Evansville & Terre Haute Railroad, a force of men went into a coal mine on the 5th inst., to resume work after a week of idleness. There was a gas explosion and the mine was wrecked. Eleven men have been taken out badly injured and mutilated. Four will die.

KANSAS.

Cherokee County.

(From our Special Correspondent.)

American Spelter Company.—This company, at Galena, fired up its zinc smelter last week. The production of spelter commenced this week.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—The Red Jacket, or perpendicular shaft of this company, has still 2,200 ft. further to go, and with progress of about 100 ft. per month, will probably not be completed to its expected depth of 5,000 ft. for two years. The south end of the Calumet & Hecla mine still continues rather poor beyond the Black Hills district, but sinking at Nos. 9 and 10 shaft continues.

Huron Mining Company.—The company's property has been turned over to Mr. James B. Sturgis, who purchased it in May, 1892. The time for redemption has expired.

Iron—Gogebic Range.

Metropolitan Iron and Land Company.—The superintendent reports 400 men at work. The coal is now being used and the company has 75 men employed in getting cordwood.

Iron—Menominee Range.

Chapin Iron Company.—Everything is very quiet at this mine. No ore is being shipped. The water is kept down by the pumps at the A. I. shaft. The entire working force does not now number over 20 men.

Dunn Mine.—An attachment for \$300,350 has been levied against this mine to secure Messrs. Corrigan, Ives & Co., of Cleveland.

Pewabic Iron Company.—This company reduced its force August 31st to 300 men, letting 100 go. In addition the scale of wages was lowered.

MINNESOTA.

Duluth County.

(From our Special Correspondent.)

Ore shipments from the Vermilion range to September 1st were 590,000 tons, 269,300 tons from the Minnesota, 316,350 tons from the Chandler and 4,350 tons from the Zenith. To the same date in 1892, these mines had sent out 775,280 tons. Weekly shipments are now about 25,000 tons, which, it is thought, will be almost maintained till November 15th, giving a total for the year of over 800,000 tons. Mesaba shipments are about 20,000 tons weekly, and are likely to increase somewhat. Ore freights have advanced 5 cents a ton from the abnormally low figure prevalent nearly all summer and stand at 55 cents. Three ore vessels Sunday took aggregate cargoes of 8,340 gross tons.

Iron—Mesaba Range.

Biwabik.—It is reported that a second 100,000 tons of ore has been sold by P. W. Kimberley from this and the Ohio mine.

Commodore Mine.—This property and the Franklin were closed in August.

Lone Jack Mine.—The sale of this mine to the Merritt-Wetman syndicate is about closed, the terms being on a basis of \$125,000 for the lease.

Oliver Iron Company.—Night crews have been put on. Drake & Sutton, who have the contract for stripping, have over 100 men employed at it.

(From our Special Correspondent.)

The Mountain Iron goes into the new syndicate, which is to be a Standard Oil deal in ore mining, on a \$3,000,000 basis, the Biwabik on a \$2,250,000 basis, the Mesaba Mountain at \$1,750,000, the Shaw at \$400,000, and the Adams, Lake Superior, Lone Jack, Shannon and others at not far from \$3,500,000 more. The Duluth, Mesaba & Northern road is to go in at about \$2,500,000. The Alby syndicate group of Gogebic mines are also understood to be in the deal, and the receiving docks and railway at Conneaut, O. A capitalization of not far from \$27,000,000 is understood to be in the deal.

Biwabik Ore Company.—Total shipments for the Kimberley interests, operating this and the Ohio, are now expected to be 200,000 tons for the year.

Commodore.—The shutdown here is over and 600 to 800 tons are being shipped daily.

Great Northern.—This company has found good bodies of ore in 9-58-17. This company and the Great Western are to be taken into the great combination to be known as the Lake Superior Consolidated Mines Company that is now being organized by the New York, Mesaba and Gogebic combined interests, on a basis for the two of \$1,600,000.

McKinley.—Ore has been found on the McKinley townsite, and the village will have to be moved.

Shannon.—This property, in 58-16, has pushed developments until it has shown a large body of ore.

Iron—Vermilion Range.

(From our Special Correspondent.)

No early resumption is expected at the Minnesota and Chandler mines, rumors to the contrary notwithstanding.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

Joplin, Sept. 4.

There has been a marked activity in this district this week, due to the rapid advance in the price of lead. Almost every miner is mining all the lead he can and leaving the zinc ore for better prices.

Lead advanced during the week from \$18.50 to \$20 per 1,000 lbs., the market closing with an upward tendency. Zinc ore remains unchanged at \$16 to \$19 per ton, and only a small amount of ore is being sold, except by small operators.

The Mine Operators' Exchange held an important meeting on August 29th. Great interest is being taken in this movement, and while at the present time the operators may not succeed in advancing the price of zinc ore, I believe that they will succeed in selling their zinc ore to the smelters on its assay value, based on the market quotations of spelter (see last week's issue of the "Engineering and Mining Journal"). Some of the ore purchasing agencies here seem to think that the operators are making a wrong move and should still adhere to the old plan of allowing the ore buyers to name the price. Following are the sales of ore from the different camps for the past week: Joplin mines, 839,260 lbs. zinc ore and 363,670 lead, value \$13,987; Webb City mines, 201,710 lbs. zinc ore and 30,730 lead, value \$2,314; Carterville mines, 197,300 lbs. zinc ore and 157,320 lead, value \$6,342; Oronogo mines, 24,480 lbs. zinc ore and 112,430 lead, value \$2,165; Alba mines, 43,000 lbs. zinc ore, value, \$365; Granby mines, 268,080 lbs. zinc ore and 90,500 lead, value \$3,506; Galena, Kan., mines, 585,000 lbs. zinc ore and 131,200 lead, value \$6,649; district's total value, \$35,328; Aurora, Lawrence County, mines, 469,100 lbs. zinc ore and 130,210 lead, value \$5,681; lead and zinc belt's total value, \$41,009.

MONTANA.

The Butte "Miner" says: The hills are filled with prospectors in search of gold ore and placers. Some are said to have made good discoveries.

Work on the Butte, Anaconda & Pacific Railway is being pushed; 10 miles are laid and 15 more to lay to reach Anaconda will be finished September 15th. Work on the hill lines in Anaconda is going ahead rapidly, says the Anaconda "Review."

The Helena land office has decided in favor of the protestants in the case of Thos. Ferguson et al. vs. Magnus Hanson et al., involving the Priscilla, Georgiana and Dorcas lode claims, situated north of Big Butte.

Beaverhead County.

Golden Leaf, Limited.—The Empire works have been closed. Manager Longmaid found it impossible to carry on the works at a profit with low-grade silver ore low in price, and damage suits to settle.

Jefferson County.

Elkhorn Mining Company, Limited.—The superintendent reports for July as follows: 650-Ft. Level, South, Back Stope.—The vein is 18 in. wide, and assays 35 oz. The ore is dry. Crosscut, No. 2 Stope.—The vein is 3 ft. wide, and assays 40 oz. Some bunches of richer lead ore are found in the dry quartz. Outside Stope, 120 Ft. South of Shaft.—The vein is 2 ft. wide, of the dry class of ore, and the assay value 30 oz. 850-Ft. Level, North.—The vein is 5 ft. wide in the breast. On the hanging side the ore is dry, and averages 35 oz. for a width of 3 ft. 6 in. On the footwall there is 18 in. of oxidized smelting ore, which assays from 90 to 100 oz., with 12% lead. 1,050-Ft. Level, South.—In the Main Back Stope the ore is 3 ft. wide, and assays 45 oz. 1,250-Ft. Level, South.—The main stope is holed to the 1,150-ft. level. In the pillars and north end the vein is 6 ft. wide, and of an average value of 35 oz. 1,350-Ft. Level, South.—The main stope has 8 ft. of ore at the south end and 10 ft. in the center. The average value is 35 oz., with a small amount of richer smelting ore occurring in the usual bunches. The general appearance of the stope is very favorable. Prospecting was actively carried on in the 750 and 950-ft. levels, north and in the 1,150 and 1,250-ft. levels, south. A small ore body was found in the 750-ft. level and an irregular streak in the 950-ft. level. At this place the breast is in ore and the prospects are good. During the month 2,157 cars, containing 1,037 tons, were broken out. The mill started up again on the 6th of the month. The following shows the work done at the mill: Dry tons panned, 83; average assay value, 39 oz.; average per cent. salt used, 14; average value of tailings, 3.62 oz.; average per cent. saved, 92; number of Dore bars produced, 39; number of ounces fine silver, 31,360; number of ounces fine gold, 30,659; batteries in service, 24 days, 2 hours, 36 minutes; pans in service, 25 days; estimated value of bullion shipped, \$21,910; actual returns for 214 tons ore shipped, \$10,598.85; total, \$32,508.85; current expenses, including salaries, labor and supplies, \$22,271.01; balance, being profit for July, 1893 (or at \$4.85 to pounds sterling, £2,110), \$10,237.84.

Madison County.

Capt. C. S. Shoemaker, State Inspector of Mines, returned from a business trip to Pony and other sections of Madison County, on the 29th ult. He informed the Butte "Miner" that the miners of Pony and vicinity had turned their attention to gold, and were showing up some splendid properties. They had hoped that something would be done for silver, but having been disappointed therein they had gone to work at gold mining. In consequence, the district is prosperous. Mr. Shoemaker is of the opinion that if more people in Montana would turn their attention to gold mining while

the cloud is hanging over silver, the State would not feel as if it had lost its best friend. In his travels he has seen many gold claims which he is confident would become large producers if opened up.

Park County.

A report from Livingston states that at Coke the reduction of 10%, made lately, resulted in a fight between the miners who accepted it and those who did not.

Silver Bow County.

The mines of the Boston & Montana, Butte & Boston, Butte Reduction, Colorado and Heinze companies are in operation, says the Butte "Miner." Not all, however, are being worked to their full capacity. The Parrot smelter is still working in a small way, but will close as soon as the supply of ore on hand is exhausted.

Butte & Boston Mining Company.—The Comanche mine, at Meaderville, is said to have passed into the hands of this company. The Comanche belonged to a company comprising H. H. Zenor and Nicholas Bielenberg, of Deer Lodge, who each held a sixteenth; Charles S. Warren an eighth, Lee Mantle an eighth, George Tong a fourth and P. A. Largey three-eighths. The lease was to cover a period of a year, but the bond was for only two months. August 10th Mr. Mullin transferred the lease and bond to the Butte & Boston company, which has been operating the mine since. It is understood that the Butte & Boston will at once commence sinking the shaft, which is now down 375 ft. The Comanche is almost a full claim, and is considered a valuable piece of ground. It is located in the heart of the copper belt and might be considered the keystone between the Boston & Montana and the Butte & Boston's old properties.

Britannia.—P. A. Largey, commenced action against Lee Mantle on the 29th ult., to recover judgment for \$15,000, alleged to have been received by him on the sale of the Britannia quartz lode mining claim.

Broadway.—A company of capitalists has purchased this group of four gold claims, located two miles from Silver Star.

The Goldsmith.—The depression in silver has caused the owners of this property to check the work of development to a considerable extent, but a little ore is still being extracted.

NEVADA.

Eureka County.

Diamond Mining Company.—Maurice Hartnett, of Eureka, who is connected with this company, informs the Salt Lake "Tribune" that the mine is now closed. Mining in Eureka is very quiet at present. Only a few of the smaller properties are being worked by leasers.

Storey County—Comstock Lode.

During the latter part of August, says the Virginia City "Chronicle," the Comstock mining companies have shipped a larger amount of ore to the river mills for reduction than for a long period of time previous. Most of the ore shipped is from the Gold Hill mines. The ore is milled at the Mexican, Santiago and Brunswick mills, on the Carson River. During the past two weeks the V. & T. railroad transported to the river mills 139 cars. The capacity of an ore car is eight tons, but the dumps are not loaded that heavily. Thirteen cars average, as at present loaded, about 104 tons. The V. & T. has on the road 115 ore dumps, but all are not needed, even during the present heavy shipments. By the end of the month the ore bins at the mines shipping rock to the river mills will be pretty well emptied.

The Virginia City correspondent of the New York "Sun" writes: The Miners' Union refuses to pay any further attention to the proposal of mineowners for a reduction of wages, and has unanimously voted to ignore its committee's suggestion of a conference with superintendents. The Virginia & Truckee Railroad reduced wages 25%, but the Miners' and Mechanics' unions promptly compelled the railroad to rescind the order so far as it related to locomotive engineers. The miners will not hear of any talk of reducing wages as long as the companies retain big staffs of gilt-edge assessment devourers. The way in which Comstock mines have been looted is illustrated in the facts that came out at last week's meeting of the Alta company. Treasurer Derby's books showed a shortage of about \$20,000, although Secretary Osborn has made sworn statements every month that the missing cash was on hand. Derby says he is not a defaulter, but that Seth Cook, his predecessor, was short \$50,000, and that he (Derby) has paid up \$30,000 of that deficit. Derby never made any report of Cook's deficit, however. The truth seems to be that the shortage is the result of the usual Comstock scheme of mine managers running a mill at the expense of stockholders. Derby and Cook started the American Milling Company at the expense of the Alta shareholders, and a note for \$50,000 was given by the American to Alta to cover the debt. The note was unsecured, and the American Milling Company has no property. The stockholders have fired the board of directors, elected a new board, reduced fancy salaries 40 to 70%, and propose to bring actions against Derby, Osborn and the old directors. The company is \$8,000 in debt. Utah Consolidated shareholders have paid \$420,000

in assessments during the past 20 years, but they refused to pay the last assessment levied to pay a lot of salaried officers and two miners, and the mine is now closed.

Belcher Mining Company.—The latest official weekly letter says: Winze No. 1, below the 200 level, was extended 3 ft. and a south drift from the bottom was extended 3 ft.; a south drift from the bottom was started and extended 9 ft. North drift from upraise from cross-cut 1 was extended 15 ft. We are getting some fair-grade ore at this point.

Consolidated California & Virginia Mining Company.—Bullion, valued at \$16,525.59, has been sent to the Carson Mint, making a total on August account to date of \$31,196.10.

Hale & Norcross Mining Company.—The latest official weekly letter says: On the 1,300 level, we are cutting out a winze station north of the shaft, preparatory to starting a new winze on the ledge. The preliminary work has disclosed fair-grade ore, which this winze will follow. Sinking will be commenced immediately.

Lady Washington Consolidated Mining Company.—At the delinquent sale of stock of this company, just held, 75,276 shares were forfeited to the company for non-payment of the assessment of 10 cents per share. The assessment was paid on 32,724 shares of the 108,000 shares of capital stock. The indebtedness of the company amounts to a few hundred dollars only, and there are some outstanding claims which, when collected, will put a good surplus in the treasury.

Potosi Mining Company.—The latest official weekly letter says: The east cross-cut from the south drift, 220 ft. south of the shaft, 850 level, is out 45 ft.; face is in soft porphyry and streaks of low-grade quartz. The east drift, 73 ft. above the 930 level, has been connected with top of north raise from the 930 level; total length of drift, 155 ft. Extracted and sent to the mill the past week, 336 tons of ore from the 930, 1,000 and 1,150 levels. Milled during the week, 336 tons. On hand at mill, 100 tons and 1,950 lbs. Average battery assays, \$25.30; average car sample assays, \$33.83 per ton.

Savage Mining Company.—The latest official weekly letter says: On the 1,100 level we are extracting ore of fair grade from the 15th floor to 19th floor. The east drift from the 19th floor of the west stope, is in a total distance of 32 ft., and connected with the upraise from the east stope. The connection improves the ventilation and facilitates the extraction of ore and prospecting. During the week we have hoisted 286 cars of ore from this level, shipped to the Nevada mill 210 tons and milled 210 tons. Car samples average \$25.08 per ton. Battery samples average \$21.50 per ton. Bullion yield for the week, \$3,160.50.

Segregated Belcher & Mides Consolidated Mining Company.—In the Segregated Belcher mine the inclined raise from the top of the vertical raise from the 1,200 level is up 40 ft. It is so close to the 1,100-level winze that any blast is liable to break through. According to the latest official weekly letter, the top of the raise is in quartz and porphyry, with bunches of good ore through it.

White Pine County.

Exchange Mining Company.—This company has been incorporated to take over the Waverly gold mine, with a capital stock of \$1,500,000, divided into 300,000 shares. A. Hauaner, Jr., is the president; J. R. Middlemist, vice-president; W. J. Barnett, secretary, and Jefferson M. Howell, general manager. The chief office of the company is in Salt Lake City.

Keystone.—The papers of incorporation of this mine, at Vanderbilt, have been recorded. The company is incorporated under the laws of Iowa and the capital stock is \$1,000,000, divided into shares of \$1 each. S. T. Godbe is president of the company.

NEW MEXICO.

Grant County.

Shipments of gold from the Pinos Altos district are now, it is reported, as heavy as they have ever been since the mines were opened there. Placer gold forms a very important part of the shipments, and will continue to do so for some time to come. All the mills there are in operation, and more work is being done in the mines than for some months past. A great deal of work is now being done in the Mogollons and the mines at Silver Creek. The mines at Mogollon are said to be looking well and some recent discoveries are being developed with encouraging results. There is a great deal of prospecting in the mountains. The heavy rains during the past six weeks have been favorable to prospectors.

Lincoln County.

Miner's Cabin.—An important gold strike is reported in the White Oaks district, in the Miner's Cabin mine, which joins the Old Abe on the south. The Miner's Cabin has been worked at intervals for 14 years, but with little success. The lessees spent several thousand dollars without finding any pay ore. About a month ago it was decided to sink a new shaft about 50 ft. south and 15 ft. east of the old shaft. A vein 16 in. wide was discovered, which is very rich, comparing favorably with the ore found in the Old Abe mine.

OREGON.

Baker County.

Big Bonanza Mining Company.—This company has been incorporated in Tacoma, Wash., with a capital stock of \$1,000,000. The trustees are W. F. Sargent, Stephen Ryder, Fred. C. Miller and John W. McKechnan, of Tacoma, and E. E. Lewis, of Chicago. The property of the company is near Baker City.

PENNSYLVANIA.

Anthracite Coal.

The fire in the Pettibone colliery of the Delaware, Lackawanna & Western Coal Company, which has been burning since an explosion in the workings about two months ago, has at last been extinguished, but an immense amount of water which has been pumped in from the Susquehanna to bring about this result cannot be gotten out under two months more.

Butler Coal Company.—An explosion of gas occurred at this company's mine, at Smithville, and fire ensued. The flames are located in the Marcy, one of the upper veins. It is possible that the mine may have to be flooded.

Bituminous Coal.

All the operators in the Beech Creek and Clearfield regions have offered their miners the choice of accepting monthly payments or submitting to a 10% reduction. The miners held a conference last week, but came to no decision. About 5,000 men are concerned.

The disruption of the United Mine Workers, in the Clearfield region, which has long been threatened, has finally come to a head. Nine local assemblies have withdrawn from the union and made application to the executive board of the Knights of Labor for a district assembly charter. The application is strongly opposed by John McBride, national president of the United Mine Workers, but there is a strong probability of its being granted. The struggle by the miners against the monthly payday still continues.

SOUTH DAKOTA.

Lawrence County.

Caledonia Mill.—In regard to the shutting down of this mill and mine, the Lead "Tribune" says: Every stamp is continually dropping, and there is no occasion to fear anything different. The number of miners employed in the Homestake and associate mines is as great as ever.

Cambria Mining Company.—This company, at Lead City, September 1st elected H. M. Corlier, president; Geo. Beemer, treasurer; A. W. Miller, secretary.

Golden Reward Mining Company.—At Deadwood the clean-up for the last half of August amounted to 270 oz. fine gold.

Noble Grand Milling and Mining Company.—The mill in Two Bit Gulch has started on ore from the Greenough property. It handles, with the 10 stamps, about 30 tons a day.

Pocahontas.—The main tunnel is now in 340 ft., and near its face a shaft has been sunk 28 ft. It was started for the purpose of striking the second contact of quartzite. Recently a small seam of ore made its appearance, says the Black Hills "Times." The company has a large amount of dry silicions ore on the dump.

Rochester & Black Hills Gold Mining Company.—Adverse mining suits between Alfred Fillion, J. K. and W. H. Gilerist and this company have been filed. Judgments filed involve the Flower of the Hills, Rochester, Greenback and Golden Dream lodes.

Ross-Hannibal Mining Company.—This company has reduced its force to 19 men.

Ruby Flat Mining Company.—The directors September 1st levied an assessment of one mill per share on the stock. The property of the company is situated in the vicinity of the Portland group and is fairly well developed.

St. John Mine.—Alf Graham has sold 1-36 interest in this mine, near Lead, to A. S. Raymond, of Lincoln, Neb., for \$2,000.

Pennington County.

Black Hills Mining and Milling Company.—J. D. Lake, of Rapid City, has been appointed receiver of this company, and the amount of his bond fixed at \$60,000. The company's plant at Rapid City was operated successfully for a time, but for months it has been running behind and the indebtedness is now said to be in the neighborhood of \$83,000. It is thought that the stockholders will reorganize and by changes in the management put the concern on a paying basis.

Harney Peak Tin Mining Company, Limited.—The Deadwood "Daily Pioneer" says: All hopes for the resumption of work on the Harney Peak company's properties are dead. The entire works of the company are closed down. The pumps were taken from the mines and the men, with the exception of the watchmen at the mill, have been laid off.

UTAH.

Beaver County.

Rob Roy.—The new mill at this mine is at last completed, and the owners expect to start within a day or two.

Cache County.

The Beck-Cache copper mine is said to be looking better.

Emery County.

Active preparations for the immediate development of the new gilsonite and ozokerite deposits will be made when William A. Perry returns from the East, says the Price "Telegraph."

Juab County.

The Bullion-Beck & Champion and the Centennial Eureka are paying \$2.50 to miners, and have reduced board to 75 and 80 cents per day, the latter property having started up on the first of the month, with 30 men. The Eureka Hill and Keystone keep up the old schedule of wages. A meeting of the Miners' Union, of the Tintic district, was held on the 27th ult., to discuss the recent cut in wages at some of the mines. As a result the members were given the privilege of accepting employment wherever they could get it at the ruling price, until some action is taken on the silver question.

Bullion-Beck & Champion Mining Company.—The working force of this company has been increased to 75 men, a night shift having been put on recently. They are shipping about one car a day of lead ore, and storing dry ores for the present.

Mammoth Mining Company.—About 40 men are employed at the Mammoth mine, and about the same force is now working on the new mill.

Millard County.

There is prospect that the onyx quarry, owned by R. A. McBride, of Fillmore, will soon be opened. A local paper says negotiations for this are now in progress. The quarry is situated about 30 miles northwest of Deseret. The ledge is about 5 ft. thick and of various hues, from light to dark, the veins and shades, while being strongly marked, merging into each other in a beautiful manner. Mr. McBride states that he has sent specimens to Eastern experts who pronounce it equal to Mexican onyx.

Salt Lake County.

Work on the copper plant, at Salt Lake City, is being checked considerably by the delay in getting the ironwork. It is said, however, that 20 cars are expected to arrive in a few days, and then work will go on rapidly. Work is said to be progressing satisfactorily on the gas well. They passed through a stratum of gas on the 31st ult., which the Salt Lake "Tribune" says could be made to pay. The well is now down 970 ft.

Summit County.

The Ontario amalgamating mill made the following shipments of bullion in August: On the 2d, 44 bars, containing 25,822.29 fine ounces of silver; on the 21st, 41 bars, containing 14,312.19 fine ounces.

The new copper smelting and refining company, of Salt Lake, are creating much interest in the development of copper properties in the territory, says the Park City "Record," and as a result the deposits in the Snake Creek district are being investigated.

Daly West.—A few men were put to work at this mine on the 1st inst. The machinery will be overhauled and the property placed in condition for active work.

Ontario Silver Mining Company.—This company has commenced ore shipments again and several teams are kept busy hauling to the Park City sampling mills. Shipments, however, are not being pushed and the ore bins at the mines are kept pretty well filled up. The new leaching plant has been placed under cover.

VERMONT.

The slate manufacturers of Granville and vicinity have agreed to shut down all the quarries on October 1st for an indefinite period. Norton Brothers have nearly 20,000 squares of slate on hand, and nearly every quarry is loaded up. The shutdown will affect nearly 2,000 employees, many of whom have families.

WASHINGTON.

There is great activity in placer mining in and around Bockendary City, says the Spokane "Review," and some good returns are made from the pan as the Pend d'Oreille and Columbia go down. The Kootenai Hydraulic and Placer Mining Company has a large force at work. It has four miles of ditch and 600 yds. of pipe in operation. It will make a good clean-up this fall. The Fort Shepard & Nelson tracklaying is now five miles above Sayward.

Olympia Graphite Company.—This company has been incorporated in Olympia, with a capital stock of \$1,000,000. The following officers were elected: J. W. Robinson, president; W. W. Wetmore, vice-president; R. G. Graham, secretary; George Wotman, treasurer, and Thomas Swan, superintendent.

WISCONSIN.

Ashland Port.—The total shipment of iron ore from this port to September 1st amounted to 787,525 tons, a decrease of 455,988 tons as compared with last year.

Iron—Gogebic Range.

(From our Special Correspondent.)

Ore shipments from Ashland last week were as follows: Norrie and East Norrie, 9,473 tons; Newport, 3,086 tons; Tilden, 7,730 tons; total, 20,290 tons. To September 1st the season's shipments are only \$10,000 tons. At the Norrie operations have been in a small part resumed by a day shift. Gogebic shipments for the year will hardly exceed 1,000,000 tons, the smallest total since 1886. Over 2,500 foreign miners have left the range for their homes.

FOREIGN MINING NEWS.

AUSTRALIA.

The "West Australian" contains the following report by the Government geologist of Western Australia on the Yilgarn gold field, which is now attracting much attention, and an account of which was published in the "Engineering and Mining Journal" on Aug. 26th:

I accompanied the Superintendent of Water Supply to Yilgarn, and whilst on the fields I visited all the mines then at work, and am glad to be able to express my satisfaction with the appearance of the lode in depth, the great drawback to the successful working being still the scarcity of water. At Coolgardie very little was being done, as all the alluvial workings within an easy radius had been worked out, and water had to be purchased at one shilling per gallon. I was unable at the time to extend my examination of the country further to the eastward, as there was no water in that direction, but since I left the field rain has fallen over the back country, and the prospectors are now scattered over it. There is a very large number of men on the field, and should there be a wet season, there will in all probability be a famine, as the new roads will be almost impassable during the winter. Referring specially to Coolgardie, the Government geologist reported: At Coolgardie a rich patch of alluvial ground was discovered about a year ago, which since then has been turned over several times. Up to the present no deep ground has been discovered, a good deal of the gold being found on the surface, as on the Murchison. Very few auriferous reefs have yet been found, the gold in the alluvium being apparently derived from rich leaders. On this field the most sensational discovery is a reef found by a man named Bayley, and from his reward claim over 4,500 oz. of gold have been taken. This reef consists of a small blow, running in a northwesterly direction and underlying to the north-eastward, striking across the line of country, which here runs nearly north and south. This reef is about 9 ft. in width at its largest part, but it pinches toward either end of the claim, where it is entirely lost. At the north end there is another blow of quartz, which strikes north and south, following the line of the strike of the country. This blow then dips under the alluvial flat, but a reef on exactly the same line is met with in a shaft in the gully, after which it appears to be lost; but to the north-westward is another large blow, which follows exactly the same bearing as Bayley's reef, and has been taken up by the same company as a lease. From this reef a very nice lot of stone is said to have been taken, but the hole has now been filled in. At the north end of this blow it pinches out, but on the western side of the gully is another large quartz blow which exactly on the same line as Bayley's, but between which there is apparently no direct connection. At the south end of Bayley's the reef is lost as at the north, but to the westward, on a hill, another lenticular mass of quartz carrying gold is met with. From the general character of the reef, it appears to be a true fissure vein, making in size when it follows its true course across the strike of the country, and pinching often to a mere thread when it follows the hedding plane of the rock. This, of course, is not at present proved, as so little work has yet been done on any of these leases. The breaks in the lode may of course be entirely due to faults or throws, but the blow at the north end of Bayley's claim and the reef in the gully seem to prove the former theory. All the gold from this reef has been taken from a small hole at the north side of the blow, where there appears to be gold associated with a little oxide of iron. There were also some handsome specimens of gold in quartz, and some portions of the reef carry a good deal of fine gold. It appears to be either the top of a rich shoot or merely a hunch, most probably the latter. In either case, it cannot be expected to continue so phenomenally rich much longer, although it may pay well to work. None of the reefs here are yet sufficiently developed to express any opinion, but some of them are well worth prospecting. There are several well-formed reefs showing gold about five miles farther south and another patch 25 miles northward. The available land for prospecting in the immediate neighborhood of Coolgardie is limited, as this belt lies between the granite country and the freehold land of the Hampton Plains Company; but during the winter we shall probably hear of new discoveries to the north, east and south-eastward, as there are some hundreds of men out prospecting. When we consider the quantity of gold taken from Coolgardie, it is highly probable that some of these reefs will turn out very good payable mines.

New South Wales.

Prospecting in the Adelong district is being carried on with great vigor, and at frequent intervals some new find is made or satisfactory crushing trial reported.

New Koh-I-Noor Gold and Silver Mining Company.—The balance sheet of the half-yearly report shows an increase of £1,328, the debt balance being £1,509 against £2,737 last year. Owing to the want of capital to erect a suitable plant to economically treat the large bodies of ore, work was carried on at extra cost, much of which could, under other circumstances, have been saved. The mine products since January 31st. were 168½ tons matte and 2½ tons bullion, valued at £9,424, making a total output from the mine since start of smelting in January, 1892—18 months—of 1,754 tons matte and 14½ tons bullion, valued at £45,742, and upon which £25,764 had been advanced; and leaving 123 tons matte and 4 tons bullions still unsold in London, valued at £6,247, and estimated to realize a surplus of £300 to £900 over and above the advances made.

A discovery which is likely to lead to the opening up of a large tin field is reported to have been made near Elsmore, at a spot about 10 miles east of Inverell, on the McIntyre River, according to the "Australian Standard." For some months Thomas Bros. and party have been engaged putting down a bore on the river bank, on the supposed course of the old river bed referred to by the late Mr. C. S. Wilkinson in his report on the tin fields of New England, published in 1872. Some time ago it was thought that the bore was bottomed on trap, but the prospectors kept on, and finally broke through into wash carrying good tin at a depth of 193 ft., or 170 ft. below the present river bed. Latest reports state that 3 ft. of wash has been penetrated, and is still going down. As all the leads which have been worked or are now being worked at Elsmore and Newstead fall into this old valley, the striking of tin at this depth old miners and experts say will lead to the largest alluvial tin field ever struck in New South Wales. Newstead & Co.'s prospects have greatly improved since the true bottom was reached; although the tin on the false bottom was good in patches, nothing of any extent could be obtained. Now they have 8 ft. of wash in the drives going in four directions from the Monkey shaft.

Victoria.

In the central division of Ballarat the output of gold during the quarter ending June 30th was 23,279 oz., 639 oz. coming from alluvial, 804 oz. from pyrites, and the remainder from 56,000 tons of quartz. In the first quarter of 1893 the output was 21,545 oz. and 50,546 tons of quartz were crushed. The dividends for the past quarter were £17,225, as compared with £22,744 in the previous three months, and, as usual, the Star of the East Mine contributed the bulk of the amount, distributing £12,000 as against £14,000. The field employs 2,397 Europeans and 144 Chinamen.

BRITISH COLUMBIA.

Development work on the Yosemite claim on Liddle Creek has been pushed off late with satisfactory results. The ledge has been found to be continuous for at least 1,500 ft. and is in places 11 ft. wide, 3 ft. being clean galena and the rest good concentrating ore. The galena carries over 150 oz. of silver to the ton.

Ainsworth Mine.—The lessees of the No. 1 mine will make a trial shipment of 40 tons of ore to the Tacoma smelter. The ore is of four grades, namely, first-class, carbonates, and high-grade and second grade concentrates, 10 tons each. The first-class ore should go 200 oz. to the ton, the carbonates 120 oz., the high-grade concentrates 350 oz., and the second grade 150 oz. Some 20 men are kept at work, and if a concentrator were erected on the property, the mine could be worked to advantage even at the present price of silver. As it is, however, the expenses of hand sorting and jigging makes the total so high that there is little left to the lessees.

Kaslo-Slocan.—The Kaslo sampler commenced work on August 11th, by putting through some five tons of Bon Ton ore, which gave a result of 375 oz. of silver per ton and 43% lead. The sampler has a Blake crusher, a small Gates crusher and a sampling pulverizer, driven by a 25 H. P. engine and portable hoiler. The company buys ore, giving 50% of the assay value in cash on sampling the ore and the rest when the smelter returns are received. This will be a great help to small mineowners, and will enable many men to proceed with their work who would otherwise be compelled to stop from want of funds. The management is in the hands of Mr. Clymo, of Montana.

Kootenai & Columbia Prospecting and Mining Company.—This company, of Ottawa, Ont., has been working the Wellington mine since last August with most satisfactory results. The company has had a diamond drill, steam pump and steam hoist in operation, and is now shipping a large amount to Tacoma. The shipments made by this company from this mine during 1892 showed that the ore was of a very high grade, going on an average 375 oz. The vein is 4 ft. wide, 2½ ft. of this being solid ore, galena and gray copper, the other 18 in. being good concentrating ore. In conjunction with a Spokane syndicate the company is also working the Stanley, which produced 50 tons during June, and are also interested in more than 20 other claims in the Slocan country.

Similkameen Gold Gravels Exploration Company, Limited, of Vancouver, B. C.—This company has been incorporated with a capital stock of \$100,000 and shares at \$25 each. The trustees are C. E. Hope, T. R. Morrow and Henry Barwick. The company owns placer grounds along the Similkameen River.

CAPE BRETON.

Coxheath Copper Mining Company.—This mine drifting on the vein has been commenced from the crosscut on the 320 ft. level of shaft No. 2, two power drills being run. There is apparently a swell in the vein on this level, the walls being over 40 ft. apart. Mining Captain Granger reports that he has drifted east 25 ft. on an ore body, which so far fills the entire face of the drift.

COLOMBIA.

Fortuna Mine.—Development proceeds at this mine on a considerable scale, but the showing is far from what was expected. The stopes are said to be yielding fairly well. The ore raised during August was estimated at 250 tons and tributaries returned 1,113 tons.

NOVA SCOTIA.

The Halifax "Critic" in speaking of the mining outlook says: In gold mining there is nothing important. In iron the outlook is very favorable. The New Glasgow Iron, Coal and Railway Company paid no dividends, yet the business is in a satisfactory position. At the eleventh general annual meeting of the Nova Scotia Steel and Forge Company (Ltd.), held at New Glasgow on August 25th, a dividend of 8% was paid to the preferred and ordinary shareholders after writing off \$5,000 as insurance against bad debts, and \$10,500 as reserve for depreciation on plant. The coal shipments up the St. Lawrence from Cape Breton have been larger than ever before. The Dominion Coal Company are pushing work on the Louisbourg branch railway, and the Boston & Nova Scotia Coal Company lately held a meeting at Halifax, and made arrangements to proceed with the Orangedale branch, connecting Orangedale on the I. C. R. with its coal fields in Inverness County. In other sections of the province there is considerable activity in coal mining. One or two companies have been formed to work manganese. The output of gypsum in Hants and Inverness is large, and a profitable year's business seems assured. In copper, lead and antimony there is nothing new to report, but prospects are excellent for developments in the near future.

Stuart Lode.—The showing in the shaft is said to be very good. Several trial crushings have been made and yields of from ¾ to 5 oz. of gold per ton obtained. The water entering is said to cause some trouble.

QUEBEC.

Russel Mine.—According to recent reports the developments at this mine on Calumet Island have disclosed a promising vein of native silver lying below the blende at a depth of 30 ft.

QUEENSLAND.

From the mining report of this colony for 1892 it is learned that the total output of gold for 1892 was 615,558 oz., an increase over 1891 of 39,119 oz. The total quantity of silver produced was 224,810 oz., valued at £36,436. The total quantity of coal raised was 265,086 tons, valued at £123,308, and of tin, 2,339 tons, valued at £123,098. In dealing with the Charters Towers and Rockhampton districts the report states that the past year has witnessed very good progress and an increase in the output of 39,119 oz., as compared with the preceding year. The increase was due to the development of deep levels. The year's yield of gold in the Charters Towers district beat the former record, and by all appearance probably will be beaten again by the present year's output. So far mining in the deep ground has proved a success, and if the three deep shafts that are in progress should bottom on good stone a great impetus to further development in this direction will be given. However, one of the effects of the favorable termination of the experimental exploration of new strikes of gold in the deep levels caused a temporary excitement, the result being a good deal of over-speculation for a time, with the necessary sequence of proportionate depression. Owing to this not nearly so much money was available for deadwork as would have been otherwise, and development was hindered somewhat by this fact. The collapse of so many companies of mushroom growth has not been without its salutary effect, and probably mining speculation there was never on sounder footing than to-day. The Rockhampton fields show a slight falling off both in ore and gold. With the exception of Mount Morgan very little prospecting has been done, and work was confined mostly to reworking old claims. At the former place, however, prospecting has been the order of the day, and the results of the deep trial shafts that are going down now are being watched with much anxiety by the owners of the adjoining mine. The improved processes that are now being applied at Mount Morgan—open vat chlorination and Bohm's improved cyanide treatment—may solve some difficulties. The other little goldfields that help to compose the Rockhampton division present a more healthy aspect than they have done for some time.

Mount Morgan Mining Company.—According to the eighth annual report of this company the project

of building a railway has been abandoned. This is due to the fact that the cost of carriage in future will be so much less than in the past that it would not be to the company's interest to expend so much money as the line would cost. The balance sheet shows the year was started with a credit balance of £10,900, and ended with a credit of £4,400. Dividends amounting to £309,000 were paid in the course of the year, and dividend duty amounting to £15,000. The general expenditure totaled £202,000, the principal items of which were: Wages, £109,000; machinery and buildings, £5,000; stores and material, £22,000; carriage and cartage, £4,000; wood and charcoal, £18,000; new furnaces, £2,000; and contracts for sinking and driving £16,700. The total receipts were £495,000, of which £3,000 was from surplus due on gold sold the previous year, £406,000 the proceeds of gold sold in the year, £82,700 advance on gold sold the latter part of this year, and £3,300 from sales of residuals. The general manager's report shows that ore treated amounted to 62,200 tons, the yield of gold 119,900 oz. The ore treated has been mainly obtained from Nos. 3, 4 and 5 benches. No. 2 bench in the Lady Musgrave tunnel, Lady Norman bench, hopper stopes, freehold stopes and south stopes. The best quality of ore treated in the last half of the year was obtained from No. 2 bench of the Lady Musgrave tunnel. Nos. 3 and 4 benches have been virtually worked out, the only stone left there assaying under 10 dwt. to the ton. No. 5 bench has been worked only to a limited extent.

RUSSIA.

A special report by the British Consul at Taganrog on the salt industry of Astrakhan states that the Trans-Volga Steppes, in the province of Astrakhan, form an extensive salt basin, composed of the largest known salt lakes, Elton and Baskunchak, a whole group of the so-called South Astrakhan salt lake and large beds of rock salt in the Chapchachi Hill. At present the salt is extracted only from the Baskunchak and South Astrakhan lakes. One great element in the development of the industry was the establishment of steam communication on the Volga and the consequent diminution of the cost of transport. During 116 years (1747 to 1862) the lake was worked by the Government, but from 1868 to 1882 it was in the hands of private individuals. The Elton Lake is one of the largest and richest salt lakes known to exist, and covers an area of 135 square miles. The thickness of the salt bed is unknown. As far back as 1885 attempts were made to dig a well, but the work had to be abandoned at a depth of 14 ft. owing to the hardness of the salt and foul air, which prevented the laborers from remaining down more than ten minutes at a time. The salt was worked by primitive means, the only tools used being crow-bars, pickaxes and spades, and it was transported to the shore on specially constructed rafts carrying from 1 to 1½ tons. The principal drawback to the development of the industry was the great expense of transporting the salt to the landing stages at Graikín and Nicolaievsk, on the Volga. Operations on the Baskunchak Lake were first begun in the middle of the last century, but the output was very limited, and owing to the serious competition of Elton salt it dropped off altogether. It was only in 1887 that a fresh start was made. Since then the output has increased very rapidly and without any serious fluctuations. The Baskunchak Lake has an area of 66 square miles. Surveys made in 1883 prove the bed to be from 20 ft. to 25 ft. deep. The mode of extraction is similar to that practiced at the Elton Lake. Blasting with dynamite was introduced in 1877, but it is very rarely resorted to. The cost of production up to the time of the closing of the Elton establishment was the same as at the last named, the sole difference being in the cost of transport to the landing stages on the Volga. Thus, from Elton it was 5 cents per pond of 36 lbs., whereas from Baskunchak it was only 2½ cents per pond. The salt industry of the South Astrakhan lakes is chiefly carried on in the southwest of Astrakhan, in the neighborhood of the Nicolaievka, Liteinaya and Bassova villages. Here there are altogether over 70 lakes, more than half of which are being worked.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg, Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 282, 283 and 284.]

NEW YORK, Friday Evening, Sept. 8.

If such a thing were possible, it might be said that affairs in this market are duller than usual. Brokers report a better demand for certain stocks, such as the Phenix, Arizona reorganization certificates and some of the Comstocks; but the demand what it may no sales are recorded. We take it that the market is forced, and that the so-called demands are not made in good faith. This bandying about of quotations may deceive the uninitiated, but the expert dealers who now have charge of this class of stocks on the floor are far too keen to be taken in by chaff. One of the surprising features of the market is to be found in the stiffness of the price for silver. It might well be thought that the large majority in the House against the further purchase of silver bullion would break the market just as did the shutting of the Indian mint. Such, however, has

not been the case, and the best informed brokers are of the opinion that silver will not go lower to any great extent, even though the majority in the Senate in favor of repeal be as decisive as that in the lower House.

The sales for the week have been as follows: Consolidated California & Virginia, 500 shares at \$1.10; Horn Silver, 300 shares at \$2.10 & \$2.15, and Lacrosse, 700 shares at 4c.

The Brunswick Consolidated Gold Mining Company has levied assessment No. 6 of 2c. per share. The stock will become delinquent on October 6th, and will be sold on October 24th.

Boston.

Sept. 7.

(From our Special Correspondent.)

The market for mining stocks the past week has not participated in the renewed activity of the general market, and while prices have held quite firm there seems to be no special inducement to operate in the speculative list, and the orders for investment have been readily filled without any material advance, if we except Tamarack, which advanced on orders to buy a good sized lot and which could not be filled until the price reached \$139, a gain of \$9 per share.

The announcement of a \$5 dividend on Calumet & Hecla was followed by a decline of \$4 per share to \$261, dividend on and later ex-dividend a rise of \$2 to \$258 is noted.

A slight investment demand for Quincy carried the price up to \$109, a gain of \$5 for the week. Osceola improved from \$23½ to \$24 for good round lots, smaller sales are recorded at \$26 & \$25½.

The Montana stocks were quite firm. Boston & Montana touched \$21¼ at one time during the week, but reacted to \$20¼ on later sales.

Butte & Boston advanced from \$6 to \$6½ on moderate sales. The stock is not very plenty in the market, and orders for good round lots would not be easily filled at present prices.

Atlantic sold at \$7¼ @ \$7¾ for small lots. Centennial advanced from \$2¼ to \$2¾ for 50 shares, and Tamarack, Jr., from \$12¼ to \$13—a few odd lots selling at \$14 and \$15. Allouez sold at 35c.

There were no recorded sales of either Franklin, Kearsarge or Wolverine for the week.

Catalpa (silver) sold at 7c. and 6c.

The Calumet dividend is \$5 per share, payable September 27th, making \$15 paid this year, and a total of \$40,350,000 paid in dividends to date. The dividend comes a little later owing to slow collections.

3 p. m.—Boston & Montana declined to \$20 this afternoon, and Butte & Boston sold at \$6½, same as before.

The market closed dull and lifeless.

San Francisco.

SAN FRANCISCO, Sept. 8 (By Telegraph).—The opening quotations to-day are as follows: Best & Belcher, 50c.; Chollar, 25c.; Consolidated California & Virginia, \$1.25; Gould & Curry, 25c.; Hale & Norcross, 50c.; Mexican, 50c.; Ophir, 75c.; Savage, 35c., and Yellow Jacket, 45c.

London.

August 31.

(From our Special Correspondent.)

The characteristics of the stock market this week have been almost identical with those reported in my last letter. If anything, the volume of business done has been smaller. There is hardly a transaction of any kind to make a note of in the American market. Elkhorns have fallen off during the week and are now weak and slow at 9s. There have been a few irregular dealings in low-priced stock like Palmarco and Holcomb. The attention of mining share dealers has been attracted away from Americans and Australians by the trouble in South Africa, caused by the desire on the part of the king of the Matabels and Mashonas to fight.

The directors of La Plata Company, formerly operating mines in Colorado, have received information that their agent, Mr. Ninness, has secured gold claims in Mozambique. Mr. Ninness writes that, from what he has seen of the Mozambique territory, he considers it a magnificent country, and expects that it will prove to contain great mineral wealth. He has secured 10 of the original claims of the famous Birthday Reef, which has been shown to be rich in gold. The natural position of the claims is good, for a tunnel can be driven from the valley south of the claims to strike the reef some hundreds of feet below the surface. The work on this tunnel has already begun. Two new companies, the Harquahala Gold Mining Company, Arizona, and the Bonanza Gold Mining Company, California, have obtained quotations on the stock exchange during the past week. The formation of these companies was reported in these columns a few weeks ago.

As reported last week the directors of the Yankee Girl Mines, Limited, dropped the proposed reconstruction scheme, and substituted a scheme for the winding up of the company and the formation of a new company to buy over the property. This stroke of financial policy has been adversely criticised in mining circles here. The fact that the directors had the alternative scheme all so nicely drawn out and ready for presentation after their public recommendation not to proceed with the reconstruction first set people thinking, and the additional fact that there is a similarity between the names of the directorate and the names on the directorate of the mines' company who represent the debenture holders in the Yankee Girl, have confirmed the suspicion of sharp practice. The £17,000 which would have been

raised on the reconstruction scheme would have provided money to prospect, and develop and pay interest on the mortgage bonds, and there was no need to provide just now for the redemption of the bonds, which do not mature until 1895. It is impossible to interfere with the recommendation of a board of directors, especially when less than half the stock agree to the reconstruction scheme; but it is plain that though the directors did not get the support of a majority of the holdings, yet in recommending the liquidation and the formation of the new company to purchase the property from the debenture holders they were not acting without a bias in their own favor and not for the direct benefit of the shareholders. The new company has been formed with a capital of £52,000 in £1 shares.

A company called "The Aztec Gold Mines, Limited," has been registered in London with a capital stock of £100,000 to acquire mining properties in Colorado and elsewhere in the United States. On inquiry at the offices of the solicitors and signatories no information is obtainable, not even the name of the particular property in view, nor whether the company is to be brought before the public. Will not some of your readers write you particularly of this enterprise?

Very little has been heard of the Sapphire & Ruby Company, of Montana, since it was incorporated in London nearly two years ago, and the general opinion is that, in spite of the eminent gem expert Mr. Streeter's favorable report, the property does not promise any success. In fact some say that Mr. Streeter was misled in his examination by the promoters, by resort to a method not unknown in mining circles. However, the first circular sent out by the company is of interest. The secretary says: The company did not come into possession of its property until midsummer of 1892, chiefly owing to unavoidable delays in the proving of a very large number of separate titles to the lands and water rights acquired. What remained of that hydraulic season had therefore to be devoted to the construction of ditches, flumes, etc.; and hydraulic mining could not be commenced until spring of this year. Practical hydraulic mining upon a large scale was successfully begun at Eldorado Bar—the principal mine of the company—in the month of May last, and considerable shipments of gems in the rough have been received at the offices of the company in London, and at the lapidary establishment of their agent in New York, Mr. J. D. Yerrington. The weight of rough gems already received in London amounts to 171,000 carats. Alternate shipments having been regularly made from the mine to New York, it is fair to assume that approximately a similar quantity has been received by the company's agent there. It is therefore estimated that upward of 300,000 carats have been mined and sent forward within a period of eight or ten weeks. The bulk of this large quantity of stones is now in the hands of the lapidaries, and the cuttable portion is being prepared for the market. It is satisfactory to note that the stones received are of the same average quality as the specimens obtained by the various engineers and experts prior to the formation of the company, and that the quantity now being mined confirms the original statements as to the gem-producing capacity of the mine. The gem stones thus far produced have been chiefly gathered from the "under currents" of the hydraulic sluice. There has been no clean-up yet of the upper sluices where the alluvial gold may be expected to be found. It is proper to explain that the first hydraulic work has been devoted to washing out the gems from a mass of tailings, barren of gold, left by early gold miners (since 1870) in two ravines cutting Eldorado Bar, and which, unless washed now, would be lost by being covered with the tailings from this company's work. This preliminary operation was completed, and washing commenced on the regular faces of the mine—carrying both gold and gems—about the 1st of July. Under the circumstances the directors have thought it wise to postpone calling a general meeting of shareholders until later in the autumn, in order that they may then present a complete statement of the results achieved during at least the major part of one hydraulic mining season.

We desire to bring before the notice of our readers the doings of a London firm of bogus bill brokers going by the name of Lloyd Watson & Co., of 72 Leadenhall street. This firm has been communicating with merchants in Spanish and American countries, and among other victims has defrauded a firm of Mexican ore shippers. It is likely that others in the same line of business may hear from the firm, or have already heard from them, so a note of warning may be uttered here. They state in their letter to the particular firm in question that they are prepared to open a credit for them to the extent of £5,000 if the latter will remit £50 to cover commission expenses, etc. This the firm did, and at the same time advised Lloyd Watson & Co. that they intended at an early date to ship ores. After that they drew on Lloyd Watson & Co. for £500 and the draft was duly accepted. However, with the acceptance of the draft, Lloyd Watson & Co. wrote that owing to the suspension of Australian banks they experienced difficulty in meeting their engagements, and that they would be obliged to ask the Mexican firm to cable over the £500 to cover the draft in good time. The Mexican firm found that they had no credit at all, so drew against the London firm for the £50 advanced. When these two bills of exchange were presented they were dishonored.

DIVIDENDS.

Calumet & Hecla Mining Company, dividend of five dollars per share, \$500,000, payable September 27th at the office of the company in Boston, Mass.

Mollie Gibson Consolidated Mining and Milling Company, dividend No. 38 of five cents per share, \$50,000, payable September 15th. Transfer books will close September 8th and reopen September 16th.

METAL MARKET.

NEW YORK, Friday Evening, Sept. 8, 1893.
Prices of Silver per Ounce Troy.

Sept.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	Sept.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
2	1'85 1/4	33 3/4	7 3/4	562	6	1'85 1/4	33 3/4	7 3/4	562
4	1'85 1/4	33 3/4	7 3/4	562	7	1'85 1/4	33 3/4	7 3/4	562
5	1'85 1/4	33 3/4	7 3/4	562	8	1'85 1/4	33 3/4	7 3/4	562

* Holiday.

No new features present themselves in the silver market. The foreign demand is good and silver is wanted. The India bazaars and China are the buyers. Had it not been for our financial troubles the orders for silk alone which China was well prepared to meet, and for which she would have been very willing to take silver, would have created a very large demand for the white metal, and prices would have been higher than are now prevailing.

The Treasury Department 4th September purchased 150,000 oz. of silver at their counter offer of \$0.7350. The purchases thus far for this month amount to 478,000 oz.

The Director of the Mint reports the coinage during the month of August as being \$5,120,000, composed as follows: Gold, 366,420 pieces, value \$4,340,800; silver, 1,910,000 pieces, value \$674,000; minor coinage, 3,788,000 pieces, value \$105,800.

Gold and Silver Exports and Imports at New York, Week Ending September 2^d, 1893, and for Years from January 1st, 1893, 1892.

Week	Gold.		Silver.		Excess of Exports.
	Exports.	Imports.	Exports.	Imports.	
1893...	\$1,000	\$7,421,438	\$741,950	\$8,741	\$6,687,229*
1892...	69,231,477	52,993,672	21,885,667	1,676,289	27,508,131
1892...	57,955,363	6,418,327	15,100,408	1,468,024	65,139,420

* Imports.

During the five days ending September 8th the exports and imports, so far as ascertained, have been as follows: Exports, gold, none; silver, \$532,340. Imports, gold, \$2,309,496; silver, \$169,186. Of the silver exports \$73,000 was in Peruvian coin and \$70,000 in Mexican coin. It is to be noted that the exports of foreign silver coin are given at the bullion values of such coin. American silver coin is not exported, as it is not worth its face value here in gold.

A matter of especial interest is the correction made in the sum total of the imports of this country during the fiscal year 1893. We have already referred to this matter, and in our next issue will give the results of the error in detail. As it is, the correction amounts to not less than \$76,000,000, leaving the net imports of merchandise about \$17,000,000 instead of \$93,000,000, as was at first given out. This naturally does away with the argument that the heavy exports of gold during the past fiscal year were due to an adverse trade balance.

NOTES OF THE WEEK.

The official statement of money in the country September 1st, issued by the Treasury Department, shows:

The net cash in circulation increased in the month of August \$69,463,654. The money in the treasury decreased in the month \$20,511,006. National bank circulation increased \$15,687,654. In two months it increased \$24,249,229. There has been a decrease of money in the country during the year to September 1st of \$49,809,796.

The money in circulation on September 1st showed an increase in a year of \$81,306,687. The largest amount of money in circulation heretofore was in June, 1892, \$1,620,010,229, or \$60,552,442 less than now.

The summary statement of imports and exports for July, just issued by Mr. Ford, the new chief of the Bureau of Statistics, embodies a number of new features of great interest to the statistician. Heretofore this statement has consisted of a summarized account of our exports and imports, but in addition to these there has been added to the present issue a separate account of the movement of the precious metals, by months and by countries, immigration, a statement of the public debt, the money in the United States, changes in circulation, money in the treasury and many other items of interest. All this is as it should be, and Chief Ford is worthy of all praise.

A circular was issued by the Commissioner of Internal Revenue on September 7th, which might have created a panic if issued earlier. It is addressed to the various collectors and is to the effect that certificates of deposit which are made transferable

are subject to the tax of 10% levied on State bank circulation. This decision does not apply to clearing house certificates, as they are not transferable as the term is understood.

Secretary of the Treasury Carlisle reports that the silver purchased by the Treasury Department during the month of August, 1893, was 3,893,022 fine ounces costing \$2,880,532. The total silver purchased under the act of July 14th, 1890, up to August 31st, 1893, has been 163,047,664 fine ounces, costing \$151,804,170. The silver bullion on hand at the several mints is as follows: Philadelphia, 114,366,611 fine ounces, cost, \$104,310,793; San Francisco, 11,359,142, cost, \$10,201,725; New Orleans, 8,303,065, cost, \$7,213,020; Carson, 596,674, cost, \$487,218. Total, 134,625,492, cost, \$122,302,756. From the silver bullion purchased 36,087,185 silver dollars have been coined, the bullion therein contained costing \$29,502,117. This number of silver dollars is held in the Treasury for the redemption of Treasury notes, less some \$714,000 which have been redeemed and canceled.

Domestic and Foreign Coins.

The following are the latest market quotations for the leading foreign coins:

	Bid.	Asked.
Mexican dollars.....	\$59 1/2	\$61
Peruvian soles and Chilean pesos.....	.55	.54
Victoria sovereigns.....	4.87	4.88
Twenty francs.....	3.86	3.89
Twenty marks.....	4.71	4.78
Spanish 25 pesetas.....	4.75	4.80

The United States Assay Office at New York reports total receipts of silver at 95,000 oz. for the week.

Other Metals.

It is gratifying to be able to report that the improvement noted a week ago has progressed still further, and that confidence is gradually becoming thoroughly restored. Call money is much easier, but money for commercial purposes in general is still very scarce, which will, of course, interfere with generally good buying.

Copper.—During the week now closing very large quantities of copper have again been disposed of in Europe, and there also being some inquiry from consumers here whose stocks are greatly depleted, the market has been so much relieved that bids of 9 1/4 c. for Lake, made during the last few days, have been declined and 10 c. asked, this latter price being that which is asked all around at the close. Transactions in common copper have been limited, but better prices have also been paid therefor. Electrolytic we quote at 9 1/4 c., casting at 9 1/2 c., and Arizona pig, guaranteed 96%, at 9 c.

The exports last month amounted to about 9,000 tons, or practically the entire production in this country, but of course neither this can continue indefinitely nor the home manufacturers be enabled, at a jump, to resume operating as usual.

Abroad, as the sales made here for export show, there has been a good demand, and this has resulted in the prices of G. M. B.'s being driven up to £42 7s. 6d. for spot and £42 15s. for three months prompt, which figures are not quite as good as those ruling earlier in the week, there being a slightly weaker feeling at the close. The advance in refined copper prices has not been as great, but 5s. @ 10s., which is only natural, considering the large contracts that have been made for American copper, which will, in part, hang over the market for sometime to come, although the improvement in the statistical position, amounting to 1,100 tons during the second half of August, shows the astonishing fact that most of the receipts of American copper have so far gone directly into consumption. We quote: English tough, £45 @ £45 10s.; best selected, £46 @ £46 10s.; strong sheets, £53 10s. @ £54; India sheets, £51 @ £51 10s.; yellow metal sheets, 4 1/4 d.

The exports of copper from the port of New York during the past week were as follows:

Copper:			
Liverpool—Boyc.....	10 casks	12,500 lbs.	\$1,131
" " " " " "	1,302 ingots	25,000 "	2,500
" " " " " "	1,359 pigs	301,343 "	30,000
" " " " " "	90 casks	112,500 "	11,000
London—Alcock.....	5 casks	6,250 "	650
" " " " " "	6 pigs	1,118 "	110
Swansea—Boston City.....	1,100 bars	336,272 "	29,424
Havre—Methley Hall.....	666 pigs	100,066 "	8,800
" " " " " "	2,770 casks	451,730 "	49,690
" " " " " "	1,703 bars	233,709 "	25,780
" " " " " "	30 casks	37,500 "	4,700
Antwerp—Noordland.....	108 casks	135,000 "	16,800
Rotterdam—Carlisle.....	653 bars	232,041 "	20,000
" " " " " "	7 casks	8,750 "	925
" " " " " "	100 casks	125,000 "	31,000
" " " " " "	234 bbls.	292,501 "	29,250
" " " " " "	284 casks	84,839 "	8,690
" " " " " "	465 plates	40,115 "	4,000
" " " " " "	44 pigs	10,480 "	1,050
" " " " " "	90 casks	113,040 "	14,200
" " " " " "	2,577 bars	404,888 "	38,696
" " " " " "	253 casks	134,538 "	10,500
" " " " " "	521 plates	32,028 "	3,206
" " " " " "	56 pigs	12,674 "	1,260
Hamburg—Essen.....	45 casks	47,400 "	4,920
" " " " " "	151 bars	22,466 "	2,200
" " " " " "	363 plates	22,456 "	2,200
" " " " " "	72 bbls.	90,000 "	9,000
" " " " " "	816 bars	112,151 "	11,215
" " " " " "	101 casks	44,499 "	4,499
Copper matte:			
Liverpool—Boyc.....	5,069 bags	601,780 "	30,100
" " " " " "	1,992 bags	238,668 "	12,000
Swansea—Boston City.....	3,107 bags	380,532 "	14,000

Tin is slowly but steadily improving, the demand having been very good of late and deliveries rather large. It is quite evident the interior is bare of stocks and those here are dwindling far more rapidly than was anticipated even a short while ago. At the close the quotations are 19'80c. for spot, 19'95c. for September, 20'10c. for October and 20'15c. for November, with very few sellers to be found even at these prices, as higher ones are anticipated, the parity of the London price, plus the duty, being 21'1/2c.

The markets abroad show also an advance, the closing London prices being £78 10s. for spot, and £79 for three months prompt.

Secretary Carlisle has handed down a decision most important in its ultimate effect, namely, that tinned plates made from imported black plates are not produced in the United States within the meaning of the tariff law of 1890.

Special Agent Ayer's report on tin plate was given out by the Treasury Department September 6th. It shows that during the period from July, 1891, to March 31, 1893, the aggregate production of tin plate in this country from sheets rolled in the United States was 34,632,052 lbs. The aggregate amount of imported black plates which have been converted into tin plate in the United States was 39,290,282 lbs., making the grand total of both kinds 73,922,334 lbs. The increase of the March quarter over the December quarter of tin plate produced in this country is 3,300,000 lbs., and of imported black plates, 6,750,000 lbs. Ten firms use their own black plates exclusively, thirteen firms use both American and foreign plates, and nine use only foreign plates. The report for the quarter ending March 31st, 1892, shows the production to have been 29,561,399 lbs., of which 40% were made from American black plates; Ayer's estimates the production for June quarter at 35,000,000 lbs., or a total production for the fiscal year of more than 100,000,000 lbs.

Lead.—Supplies continue to be scarce and therefore the offerings from the West are so very light that much higher prices are asked. For spot lead 3'85c., New York, has already been paid. The foreign market is quite steady at £9 18s. 3d. for Spanish, and £9 18s. 9d. for English lead.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead is strong and the latest sales are at 3'72 1/2c. It looks a little as though the metal had pretty nearly reached the top."

Spelter is somewhat firmer, and the several parcels that have been sold for export have somewhat relieved the market. The demand for home consumption is still very slack, but we have to quote 3'60 @ 3'65c., New York. Abroad the markets are weak at £17 5s. for ordinaries and £17 7s. 6d. for specials.

Antimony is dull at 10 1/4 c. for Cookson's, 10c. for L. X. and 9 1/2 c. for Hallett's.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Sept. 8, 1893.

Pig Iron Production.

Fuel used.	Week ending		From Jan., '92	From Jan., '93
	Sept. 8, 1892	Sept. 8, 1893		
Anthracite.....	67	23,937	51	23,679
Coke.....	131	118,639	85	80,637
Charcoal.....	41	8,926	34	5,634
Totals.....	239	156,522	170	110,000
			6,377,915	5,857,334

We can no longer say that the week has past without event of special interest, for at the beginning of the present week the Thomas Iron Company announced a cut in prices, amounting to 50 cents per ton on foundry pig. Other dealers are chary about giving out a similar cut, but there is not the slightest doubt that they will meet any prices offered by any other company. It is stated that the Thomas company is as usual following rather than leading the market. The tidewater prices of this company on the new basis are as follows: No. 1, \$14.50 per ton; No. 2, \$13.50; No. 3 or No. 2 plain, \$12.75. For regular brands we quote as follows:

Northern brands: No. 1, \$14 @ \$14.50; No. 2, \$12.50; gray forge, \$12. For Southern iron we quote: No. 1, \$13.25 @ \$14; No. 2 F., \$12 @ \$13; No. 1 soft F., \$12 @ \$13; gray forge, \$11.75 @ \$12—all at tidewater. Scotch irons are quoted: Coltness, \$21.50 @ \$22; Eglington, \$19.50 @ \$20; Summerlee, \$20.

Billets and Rods.—As might be expected, there is but little business doing in this market. The prices quoted are merely nominal, and will so remain until business in general improves. We quote: Steel billets, tidewater, \$22.50 @ \$23.75; foreign, \$27.75 @ \$28.50; wire rods, \$30 @ \$31; foreign, \$30 @ \$40.50; Swedish, \$50 @ \$52.

Manufactured Iron and Steel.—This business has fallen off considerably and, indeed, was to be expected, owing to the action taken by the insurance companies in raising the rate for mortgage. This increase naturally threw a damper upon the building trade, which has in turn reacted unfavorably upon the iron market. A large amount of iron is needed for the Third avenue bridge, and we understand that the prices quoted by agents are re-

markedly low. We quote: Angles, 1.75@1.9c.; axles, scrap, 1.80@2.10c.; delivered; steel, 1.75@2c.; bars, common, 1.45@1.60c.; refined, 1.60@1.85c. on dock; beams, up to 15 in., 1.70@2c.; 20 in., 2.10@2.30c.; car truck channels, 2@2.10c.; channels, 1.90@2c. on dock; steel boops, 1.8@1.9c.; delivered; links and pins, 1.70@1.80c.; plates, flange, 2@2.10c.; firebox, 2.5@2.8c.; flange, 2.10@2.25c.; marine, 2.50@2.75c.; sheared, 1.85@2.10c.; shell, 1.95@2.10c.; tank, 1.75@1.90c.; universal mill, 1.75@1.90c.; tees, 1.85@2.05c., all on dock.

Merchant Steel.—This market continues exceedingly quiet. We hear of little business. Notices from Pittsburgh are more encouraging, owing to the starting up of the mills and the belief that the currency question will soon be settled. Quotations are: Tool steel, 6.50@6.75c. and upward; tire steel, 2@2.10c.; toe calk, 2.20@2.30c.; Bessemer machinery, 2.10@2.20c.; Bessemer bars, 1.80@2c.; open hearth machinery, 2.20c.; open hearth carriage spring, 2.10@2.20c.; crucible spring, 3.75@4c.

Old Material.—There is nothing doing in this market. Quotations are nominally as follows: Old iron rails, \$15@15.40; steel rails, \$12@12.75; car wheels, \$11.50@13.50.

Rail Fastenings.—The market for rail fastenings is dead. Quotations remain: Fish and angle plates, \$15@15.80 at mill; spikes, 1.80@1.90c.; bolts and square nuts, 2.45@2.50c.; hexagonal nuts, 2.55@2.60c., delivered.

Spiegeleisen and Ferromanganese.—There is absolutely nothing doing in either ferro or spiegel. Quotations are nominally as follows: 10 to 12% Spiegel, \$22@22.50; 20% \$25@25.50. Ferro, \$50@55.

Steel Rails.—There is no improvement in this market. It continues dull and uninteresting. We hear of no sales of any consequence during the past week. Quotations are unchanged at \$29 mill or tidewater. Girder rails, \$31@33.

Tubes and Pipe.—Business in tubes and pipes is very dull. Ruling discounts on carload lots are as follows: Butt, black, 57%, 10 and 5%; butt, galvanized, 50, 10 and 5%; lap, black, 67%, 10 and 5%; lap, galvanized, 57%, 10 and 5%.

NOTES OF THE WEEK.

Mr. W. R. Thomas, sales agent of the Thomas Iron Company, says in regard to the reduction of 50 cents per ton in Nos. 1 and 2 northern pig iron: "For some time the market has ranged between \$14 and \$15. Our price has been \$15. We made the reduction in order to give our customers stocks at the market price. The new rates are not made for any length of time. We are not taking contracts thereat, except with the proviso that we shall have the benefit of any advance. The exceedingly low price for pig iron is due in a measure to the forced liquidation of weaker furnaces. Many which have been recently closed have been forced to sell stocks in order to meet obligations. I do not think that the market will drop 50 cents below the minimum price of \$13, although it may sell off a little."

Buffalo.

Sept. 7.

(Special Report of Rogers, Brown & Co.)

The tone of the market continues to improve. Although the individual foundries are by no means busy, yet the aggregate of orders is quite substantial, indicating a very general improvement.

Furnaces continue to go out of blast and bank, while money is perceptibly easier, establishing conditions favorable to a sharp recovery.

We quote below on the cash basis f. o. b. cars Buffalo: No. 1X foundry strong coke iron, Lake Superior ore, \$13.75; No. 2X foundry strong coke iron, Lake Superior ore, \$13.25; Ohio strong softener No. 1, \$14; Ohio strong softener No. 2, \$13.25; Jackson County silvery No. 1, \$16.50@17.30; Jackson County silvery No. 2, \$16.00@16.80; Lake Superior charcoal, \$16; Tennessee charcoal, \$16; Southern soft No. 1, \$12.00; Alabama car wheel, \$18; Hanging Rock charcoal, \$20.50.

Chicago.

Sept. 7.

(From our Special Correspondent.)

The encouraging signs of improvement noted last week are rather more prominent. The East Chicago rolling mill resumed operations on September 6th and will continue until orders now on hand are completed. Agents of Youngstown, O., mills report the closing of a number of season's contracts for iron and steel bars for the implement makers. Large scrap dealers report inquiry as improving from mills east of here. Hence the general indications of improvement in some lines of manufacturing are more encouraging. The closing down of the South Chicago rolling mills tells its own tale of the paucity of demand for steel rails and other track material from railroads. The chances for resumption before next spring are slight.

Pig Iron continues dull and featureless, especially local coke iron. Orders are largely confined to carloads and up to 100 tons, round lot contracts being exceedingly scarce. Consumers of all grades are running stocks down to the lowest possible limit before ordering supplies. It is noticeable that orders from the outside are larger and more frequent than from local foundries. Southern coke iron is also inactive, though inquiry for round lots of soft iron is better, but at such low prices that furnaces show no disposition to accept. Current sales are very light and a cash buyer can, in reason, name his own price when for quick delivery. Lake Superior charcoal iron is quieter, and the inquiry noted last week has not resulted in business.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$16.00@16.50; Lake Superior coke, No. 1, \$13.50@13.75; No. 2, \$12.75@13.25; No. 3, \$12.25@12.50; Lake Superior Bessemer, \$14.00; Lake Superior Scotch, \$14.50@15; American Scotch, \$15.50@16.00; Southern coke, foundry, No. 1, \$14.00; No. 2, \$12.35; No. 3, \$12.00; Southern coke soft, No. 1, \$12.50; No. 2, \$12.00; Ohio silvers, No. 1, \$16.50; No. 2, \$16.00; Ohio strong softeners, No. 1, \$16.25; No. 2, \$15.75; Tennessee charcoal, No. 1, \$16.50; No. 2, \$16.00; Southern standard car wheel, \$18.50@18.75.

Structural Iron and Steel.—Demand for small lots of building shapes and bridge material is moderate. The contract price for the iron and steel structural work of the Academy of Sciences amounts to about \$8,000 and will be closed this week. Quotations, car lots, f. o. b. Chicago, are as follows: Angles, \$1.75@1.85; tees, \$1.95@2.05; universal plates, \$1.75@1.85; sheared plates, 75c.@1.85; beams and channels, \$1.80@1.90.

Plates.—Nothing at all doing. Steel sheets, 10 to 14, \$2.25@2.35; iron sheets, 10 to 14, \$2.20@2.30; tank steel, \$1.90@2; shell iron or steel, \$2.50@2.75; firebox steel, \$4.25@5.25; flange steel, \$2.74@3; boiler rivets, \$4@4.15; boiler tubes, all sizes, 65%.

Merchant Steel.—Mill agents continue to close season's contracts with the implement trade. Some of them are quite large. Tool steel drags. Quotations are: Tool steel, \$6.50@6.75 and upward; tire steel, \$2@2.10; toe calk, \$2.30@2.40; Bessemer machinery, \$2.10@2.20; Bessemer bars, \$1.60@1.70; open hearth machinery, \$2.25@2.30; open hearth carriage spring, \$2.10@2.20; crucible spring, \$3.75@4.

Galvanized Sheet Iron.—Warehouse trade is fair, considering, and mill business is improving, but the tonnage of both is only half what it was a year ago. Discounts are unchanged at 70, 10 and 5% off on Juniata and 70, 10 and 10% off on charcoal, and jobbing quantities at 70 and 7½% off on the former and 70 and 10% off on the latter.

Black Sheet Iron.—Orders from the country hardware trade are increasing, and jobbers note a steady demand, but mill business is light at 25c. for No. 27 common and 2.90@2.95c. for steel. Jobbers are making more frequent sales, and quote 3c. for iron and 3.10@3.15c. for steel, same gauge.

Bar Iron.—Contracts aggregating a large tonnage have been closed this week and small orders of about 100 tons or so are steady at 1.45@1.50c. Jobbing quotations are 1.70@1.80c. for iron and steel.

Nails.—Wire nails are in good inquiry for mill quantities, stimulated by the advancing tendency as rods are scarce. Mills quote \$1.55@1.58. Jobbing demand has improved at \$1.60 from stock. Steel cut nails are also in better demand from mill at \$1.20@1.25 base, and \$1.35 from dealers.

Steel Rails.—In a week's time there will not be a mill rolling standard sections of steel rails west of the Alleghenies, as it is officially noted that the plant at South Chicago will shut down September 16th for the season. Many extensions which had been contemplated this year in the West have been abandoned for the present. Quotations are unchanged at \$30@31. Splice bars and other repair material are very quiet.

Scrap.—Inquiry has improved and outside mills are asking for quotations, but no business of moment is noted and prices are nominal. Railroad, \$12.50; No. 1 forge, \$11.50; No. 1 mill, \$9.00; fish plates, \$13.50; cast borings, \$5.00; wrought turnings, \$7.50; axle turnings, \$9.25; machinery castings, \$9; stove plates, \$6.50; mixed steel, \$9; coil steel, \$15; leaf steel, \$15; tires, \$14.50.

Old Material.—Iron rails at \$14.50 Chicago online of railroad is a high market price. Steel rails are stagnant at \$9@13, as to length, etc., and old car wheels are variously quoted at \$11.50@13, with no demand.

Philadelphia.

Sept. 7.

(From our Special Correspondent.)

Pig Iron.—Foundry irons have been reduced from \$15 to \$14.50 for No. 1, and from \$14 to \$13.50 for No. 2. Forge iron remains where it was, viz., at \$12.50@13. The week's business has been like the business of many other weeks, confined to small lots for work in hand. There is a great deal of talk about improving conditions, but the matter-of-fact observer cannot see them. The decrease in production continues; but brokers who possess unusual opportunities for knowing say there will be no further reduction in anthracite iron output. Mill demand does not improve, but the starting up of additional mills must bring with it additional business very soon.

Muck Bars.—The efforts of manufacturers to pick up fall business do not succeed, and two or three managers will not resume work at the prices now ruling.

Steel Billets.—Western billets seem to have more chance in this market than Eastern. Deliveries are being made as low as \$22.50 for the former, and opportunities even at this abnormal price are not seized.

Merchant Iron.—Three or four more mills started up on Tuesday, and there will be a gradual resumption, so we are told, until all the mills of middle and eastern Pennsylvania are at work. Selling prices range from 1.45 to 1.75.

Nails.—The nail trade is said to be improving. Store and factory sales do not show it, however.

Manufacturers are very anxious to get their factories running full time, even before demand war rants.

Sheet Iron.—No additional business is reported this week, but all the mills have orders on hand for a week or two. As usual, the chief demand at this season is for galvanized material.

Skelp Iron.—A sharp inquiry for skelp iron is reported all around. This is supposed to be the precursor of some large orders, but the manufacturers who are familiar with what is going on are reticent as to details.

Merchant Steel.—No additional orders of consequence have been booked. Several new enterprises are to be started late this month, which will probably create a demand for merchant steel for machinery building purposes.

Plate and Tank.—The market is unusually dull, but this fact is lost sight of in view of some large orders that are about ready for the market. The danger is said to be that some Western mills that are after the business will capture it. Steel tank has been quoted down to 1.60. Heavy plates, 1.70.

Structural Material.—A number of new building operations have been begun, for which structural material will be wanted, but in unimportant quantities. That Bourse contract, which has been the football of contractors for two or three months past, is said to be coming up again. There is no change in quotations, and it is difficult to say what actual selling prices would be on a big order.

Steel Rails.—The makers have nothing whatever to say.

Pittsburg.

Sept. 7.

(From our Special Correspondent.)

Raw Iron and Steel.—Trade during the week has developed little that is new. Business that relates to the iron trade shows but little improvement. As several of the mills have started up and others are preparing to do so, there ought to be an increased demand for pig iron and billets, for mills generally had only a limited amount of stock on hand when they closed down for repairs and stock-taking. Business continues to be limited to the actual necessities of consumers; prices are still weak and irregular, with shadings of quoted prices for anything of size or for cash transactions, and there is a general feeling of uncertainty as regards the future course of the market.

Manufacturers, however, are taking a more hopeful view of the situation, although not expecting any very heavy buying during the balance of this year. In the pig-iron market the same condition of small sales, restricted output and irregular prices prevails. The demand from the consumers of crude iron has fallen off to such an extent recently that even the present decreased rate of production is in excess of the consumption, and there are indications of some accumulation of stocks in first hands, which have resulted in a number of lots of good material being offered at extremely low prices. The market for finished forms of iron and steel presents nothing special worthy of note, although the receipts of more than the usual number of small orders has resulted in a better feeling on the part of producers. Prices continue very weak, owing to the close competition for business.

The steel rail market is extremely dull, the occasional small orders for quick delivery being all that the mills have to depend upon. The outlook for winter work is by no means promising. In a time like the present, railroad bonds have been found difficult to place, and rails can't be made without cash. We continue to quote the syndicate price, \$29 f. o. b. at works.

Coke Smelted Lake and Native Ores.		Blooms, Billets and Slabs.	
Tons.	Cash.	Tons.	Cash.
600 Bessemer, Sept., Oct.	\$12.35	500 Billets, 4x4, prompt.	20.50
500 Bessemer, Sept.	12.40	150 Billets, Sept., at works	20.40
500 Mill City furnace, Sept.	12.00	Blooms, Billets and Bar Ends.	
500 Bessemer, Sept.	12.35	1,000 Billet and Bar Ends, Sept., Oct., 14.00	
300 Bessemer, Sept.	12.40	Muck Bar.	
300 Bessemer, Sept.	12.50	250 Neutral.....	21.50
200 Grey Forge, Sept.	11.80	200 Neutral.....	21.75
200 Mill City furnace, Sept.	12.00	Sheet Bars.	
150 No. 2 Foundry.....	12.75	300 At mill.....	26.50
150 No. 1 Foundry.....	13.75	Steel Skelp.	
Charcoal.		350 Wide Grooved	1.37½ 4 mo.
25 No. 2 Foundry.....	18.50	Spelter.	Cash.
25 Cold Blast.....	26.00	50 Tons per 100 lbs.	3.50
25 No. 2 Foundry.....	18.50	50 Tons per 100 lbs.	3.50
25 Cold Blast.....	25.00	Scrap Material.	
Blooms, Billets and Slabs.		150 No. 1 R. R. W.	Scrap, net.....10.00
600 Billets, Sept., at works.....	20.50	150 No. 1 R. R. W.	Scrap, net.....10.00
500 Billets, Sept., at works.....	20.60		
500 Billets, Sept., Oct., at works.....	20.25		

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Sept. 8.

Statement of shipments of anthracite coal (approximated) for week ending September 2d, 1893, compared with the corresponding period last year:

	Sept. 2, 1893.	Sept. 3, 1892.	Difference.
	Tons.	Tons.	
Wyoming region.....	349,978	444,567	Dec. 94,529
Lehigh region.....	102,979	120,395	Dec. 17,416
Schuylkill region.....	188,038	221,881	Dec. 38,843
Totals.....	638,995	789,783	Dec. 150,788
Total for year to date, 27,770,433		26,912,158	Inc. 858,275

PRODUCTION OF BITUMINOUS COAL for week ending September 2d and year from January 1st:

	1893.		1892.
	Week.	Year.	Year.
Shipped East and North:			
Phila. & Erie R. R.	618	57,992	57,043
Cumberland, Md.	69,129	2,732,954	2,479,977
Barclay, Pa.	413	36,899	36,485
Broad Top, Pa.	7,654	429,229	397,824
Clearfield, Pa.	42,738	2,674,353	2,646,489
Allegheny, Pa.	17,841	843,380	851,198
Beach Creek, Pa.	36,273	1,074,406	1,647,544
Pocahontas Flat Top.	47,535	1,857,973	1,612,637
Kanawha, W. Va.	52,673	2,195,156	1,610,758
Totals.....	274,774	11,902,347	11,239,955
Shipped West:			
Pittsburg, Pa.	18,593	833,557	859,042
Westmoreland, Pa.	26,288	1,320,453	1,124,998
Monongahela, Pa.	8,656	470,587	422,588
Totals.....	53,537	2,624,597	2,406,618
Grand totals.....	328,311	14,526,944	13,645,973

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending September 2d, 1893, and year from January 1st, in tons of 2,000 lbs.: Week, 24,550 tons; year 3,146,833 tons; to corresponding date in 1892, 3,614,723 tons.

Anthracite.

The conditions of the anthracite coal market, so far as actual trade is concerned, continue pretty much as last reported. From some quarters we hear that consumers in this city and Brooklyn have begun to lay in supplies, but the wholesale trade is just as quiet now as it was a fortnight ago.

The restriction of output recommended at the last agents' meeting seems to be adhered to pretty well, and the number of collieries which are closed down two or more days a week is greater than was anticipated by the doubting Thomases of the trade. Still, it is difficult how anyone would pursue a different policy than this while trade is in its present condition.

The negotiations between the Lehigh Valley company and the individual operators continue to be the leading topic of interest in the coal trade, and considerable talk is spent in stating what may or may not happen if such a thing or another occurs.

The leading official circular rates, subject to the usual commissions, are as follows, f. o. b. at its New York harbor shipping ports:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash.....	\$4.00	\$4.25	\$4.60	\$4.60
Free white ash.....	3.90	4.15	4.60	4.60
Shamokin.....	4.50	4.80	4.60	4.60
Schuylkill red ash.....	4.50	4.95	4.75	4.75
Lykens Valley.....	5.00	5.80	6.20	4.45
Pea, \$2.50@2.75; No. 1 Buckwheat, \$1.75@2; No. 2 Buckwheat, \$1.50.				

Bituminous.

The general demand for soft coal during the past week has been better than for some time. In addition, we hear of quite a number of orders from the shoal water ports, which cannot be reached in winter, and hence must get their supplies without delay.

The lower ports are shipping more coal than usual and, comparatively, more than the New York harbor shipping ports. Ocean freight rates have advanced, and are now quoted as follows from Philadelphia: To Boston, Salem and Portland, 75@80c. Sound ports, 70@75c. From Baltimore, Norfolk and Newport News rates are 5c. above Philadelphia prices.

Vessels are in considerable demand. The "combination" which has been formed among captains and vessel owners seems to be on the ascendant, and freights are more than holding their own at figures set by them. However, it is not probable that there will be any great further advance, for in that case vessels now out of commission, of which there is a considerable number, would be put in. This would naturally tend to keep the rates at about where they now are. It is very difficult, however, to foretell what may happen, as the demand for vessels seems to be increasing daily.

Cars are still in poor supply, and transportation is slow. The Baltimore & Ohio Railroad is basing great expectations on a very large pier which it is building at Canton, opposite Philadelphia. This will bring the Baltimore & Ohio into direct competition with the Pennsylvania Railroad, on the latter's own territory. The longer haul of the Baltimore & Ohio still leaves this road at a disadvantage as compared with its more enterprising rival, the Pennsylvania. The reduction in mining, of which we spoke in our last issue, has ceased; producers are rather increasing their output to meet the demand.

Boston.

Sept. 7.

(From our Special Correspondent.)

The action of the company's agents in fixing prices for the coming month by confirming the July circular, has imparted some strength to the market. Agents here say some of the companies have withdrawn their old prices, refusing to close contracts at them. How long this strength will continue remains to be seen. Outside individual operators continue to cut rates by from 10 to 15c, from the circulars.

In soft coal there is a better business doing. Quite a number of the mills that bought very sparingly during the past two months are now coming into the market for supplies which are in many cases needed. On the cars here the following prices are quoted: Bituminous, \$3.65; New River and Pocahontas, \$3.55, and Clearfield, \$3.37.

Rates are maintained very strongly by the combination of vessel owners. In the combination

New England owners are represented by fully 300,000 tons. Rates are: From New York, 45@50c.; from Philadelphia, 75c.; from Baltimore, 85c.; from Newport News and Norfolk, 75c.; to Sound points, 65c.

The receipts of coal at the port of Boston for the week ending September 2d were 39,363 tons of anthracite and 18,438 tons of bituminous, against 45,667 tons of anthracite and 21,178 tons of bituminous for the corresponding week last year. Since January 1st the receipts have been 1,350,231 tons of anthracite and 735,415 tons of bituminous, against 1,440,808 tons of anthracite and 503,031 tons of bituminous for the corresponding time last year. The receipts from the provinces thus far this year have been 8,667 tons of bituminous.

Buffalo.

Sept. 7, 1893.

(From our Special Correspondent.)

Items of news are very scarce. Trade continues dull; prices are unchanged for anthracite and easy for bituminous. Lake shipments have improved in volume, but freights continue at ruinously low quotations. Shippers are on the move again, and vessel men take cargoes rather than tie up. The financial situation is improving; every day brings to the surface indications that confidence may soon be fully restored.

The shipments of coal westward by lake from Buffalo from August 27th to September 2d, both days inclusive, aggregated 65,580 net tons, distributed as follows: 33,520 to Chicago, 10,850 to Milwaukee, 9,200 to Duluth, 3,060 to Toledo, 1,300 to Gladstone, 2,500 to Manitowoc, 680 to Detroit, 2,420 to Superior, 400 to Sault Ste. Marie, 600 to Bay City and 1,050 to Portage. The rates of freight were 30c. to Chicago, Milwaukee, Manitowoc, Green Bay, Bay City and Marquette, 20c. to Duluth, Gladstone, Superior, 30c. to Toledo, 40c. to Portage and 40c. to Sault Ste. Marie.

The following statistics were prepared by Mr. William Thurstone, Secretary of the Merchants' Exchange, showing the coal trade of Buffalo thus far this year, with comparisons of previous years: Railroad receipts and shipments at Buffalo of coal are not reported, by request. Receipts of coal this year to September 1st, none; shipments of coal by lake westward for the month of August, 252,945 net tons, as compared with 247,562 tons in 1892, and 239,660 tons in 1891; for the season to September 1st, 1,440,074 net tons, as compared with 1,420,347 tons in 1892, and 1,433,910 tons in 1891. The receipts of coal by canal for the month of August were 13,757 net tons, as compared with 6,145 tons in 1892, and 144 tons in 1891; the shipments for August, 2,285 net tons, as compared with 3,545 tons in 1892, and 3,072 tons in 1891. Total receipts of coal by canal for this season to September 1st, 39,429 net tons, as compared with 11,436 tons in 1892 and 625 tons in 1891; the shipments for the season, 12,024 net tons, as compared with 18,764 tons in 1892 and 19,921 tons in 1891. The aggregate shipments of coal by lake thus far this season as compared with 1892 show an increase of 19,727 net tons and an increase of 6,164 net tons as compared with 1891. The rates of freight on coal hence to points named during August this year were 50@30c. to Chicago, 45@30c. to Milwaukee, 30@20c. to Duluth and Lake Superior, 40@30c. to Green Bay, 30c. to Toledo, 30@25c. to Detroit, 50c. to Racine, 40c. to Saginaw and 35@30c. to Bay City. A year since the rates in August were at 60@65c. to Chicago and Milwaukee, 35c. to Duluth and Lake Superior points and 25c. to Toledo and Detroit per net ton free on and off.

Chicago.

Sept. 7.

(From our Special Correspondent.)

The strongest efforts yet made this season to sustain prices on anthracite have been made since the 1st inst. This applies alike to dock, car and retail coal. For the first time in over a year there has been apparently concerted action on the part of the shippers' agents, and it looks as if within a few days the circular prices fixed for this market will be strictly maintained. The only deviations from the circular at present, so far as can be ascertained, are being made by the smaller dealers here who are satisfied if they can get cartage above the cost of the coal to them. Within the past three days, however, a number of these have been "regulated" by the action of the particular shipper's agent from whom they may draw their supplies. It only requires the imperative orders of the "owners" to their agents in Chicago to maintain the same course, through the coming season, to put this market in the position in which they would have it.

It would require but little provocation to anger them, and the market would then be in worse condition than at any time during the present season, and the dealers who have conscientiously endeavored to obtain reasonable prices would have their labor for their pains. Demand is slightly on the increase and there is also a better inquiry from the country, but wholesalers and jobbers claim that they are not doing within 50% of what they were a year ago. But all agree that by the end of September the demand from every source will be active. Others are not so sanguine and believe that October will be a week or two old before there is any great activity, and some shippers think the hand-to-mouth policy will be current throughout the season. Local retail coal is slightly improved, though in many instances the usual tonnage heretofore taken has been cut down. Collections are improving.

Circular prices are at the following rates: Lehigh lump, \$6.25; large egg, \$5.85; small egg, range and

chestnut, \$6.10. Retail prices per ton are: Large egg, \$6.75@7; small egg, range and chestnut, \$7@7.25.

Bituminous coal continues in heavy supply at Chicago and on side tracks of the Inner and Outer belt railroads. The great decrease in freight traffic together with continued shutdown of so many manufacturing plants are primary causes for the glut, and operators look for very little relief until the advent of colder weather or resumption of work at mills and factories now idle. The situation in the Hocking Valley, O., has undergone a change since our last report. The miners generally have acceded to the terms of mineowners, lessees and operators, i. e., 60-day paper in payment for all labor. Nearly all the collieries are now working, and the output from thence and receipts here are normal. Many of the bituminous mines in Indiana are not working full time and a few are closed down entirely, despite which the soft coal trade is in a better condition, so far as regards prices, than it has been in years. Coal in central Illinois is quiet, as many iron interests supplied from thence are inactive. Best grades of coal from the northern Illinois fields are in moderate demand from the country trade, but prices are only fairly well maintained at the advance. Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, \$3.35; Hocking Valley, \$3.10; Youghiogheny, \$3.25; Illinois lump, \$2.70; Brazil block, \$2.75.

Coke prospects are reported as being a trifle more encouraging, though this seems rather more sentimental than real. There can be little improvement to note until iron industries become more active. Quotations are: \$4.35 furnace; \$4.65@4.75 foundry, crushed; \$5.10 Connellsville. West Virginia: \$3.90 furnace, \$4.10 foundry; New River Foundry, \$4.50; Walston: \$4.50 furnace, \$4.60 foundry.

Pittsburg.

Sept. 7.

(From our Special Correspondent.)

Coal.—Trade at Pittsburg is at a standstill. A rise in the river of a few feet enabled shippers to send out a tow of 125,000 bushels to Cincinnati and the same amount to Louisville, being the first coal that left for these ports in several months. Kanawha River shipments exceeded 1,000,000 bushels. The Monongah-Montana, Gastan and West Fairmount mining companies, of Fairmount, W. Va., employing over 3,000 men, that have been partially idle on account of the difficulty of securing currency have resumed in full. All the mines are overcrowded with orders for coal and coke. There were 40 delegates present at the miners' convention of the Pittsburg district, representing about 4,000 miners. It was determined to resist any cut in wages and accept half pay if necessary, rather than a reduction.

Connellsville Coke.—The outlook is improving. Without previous announcement there was a stirring up of suspended coke business in the region this week. The H. C. Frick Coke Company fired 288 ovens; this has had its effect on other operators, who have been holding back for fear of wage troubles, and two other concerns will put in operation this week an aggregate of some hundreds of ovens now idle. It is stated on the authority of the Frick company's general manager that the remaining idle ovens will be fired from day to day as trade conditions warrant, and that the entire 8,000 ovens will soon be in full blast. Shipments for the week aggregate 1,973 cars, an increase of 191 cars over those of the previous week.

The following new rates were furnished by H. C. Frick & Co., and differ very materially from prices going the rounds: Furnace coke, f. o. b. cars at ovens, \$1.35 per ton; Foundry coke, f. o. b. cars at ovens, \$1.65 per ton; Crushed coke, f. o. b. cars at ovens, \$1.75 per ton. Add 70 cents per ton and you have the price of coke delivered at Pittsburg.

CHEMICALS AND MINERALS.

New York, Friday Evening, Sept. 8.

Heavy Chemicals.—A better feeling prevails in the heavy chemical market than for some time past. There has been a better demand for most of the chemicals, although business has not yet assumed such proportions as might cause apprehension of a serious decrease in stocks. But the signs of a general improvement of trade at large are encouraging and lead to the belief that the excessive dullness which has of late characterized this market will disappear before long. Some sales of alkali at very low prices are reported, but it is understood that exceptional circumstances governed these values and they can not therefore be taken as indicating the actual market prices. There has been an improved demand for carbonated soda ash as well as for alkali, owing to the brighter prospects of an early resumption of work among the glass factories. Caustic soda is also in better inquiry and several sales are reported.

Quotations are nominally unchanged as follows: Caustic soda, 60%, 3'05@3'20c.; 70%, 2'80@3c.; 74%, 2'82½@3'05c.; 76%, 3@3'10c. Carbonated soda ash, 48%, 1'25@1'50c.; 58%, 1'15@1'25c. Alkali, 48%, \$1.15@1.20; 58%, \$1.10@1.20, according to package. Sal soda, English, 1'10c.; American, 1@1'10c. Bleaching powder, 2'25@2'50c.

Acids.—This market continues absolutely without change from last week. New business of any consequence is still "conspicuous by its absence," though manufacturers generally state that they doing as well as they can expect to do under the

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		Sept. 8.		SALES.	NAME AND LOCATION OF COMPANY.	Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		Sept. 8.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.			H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo.														Alpha, Nev.													
Alice, Mont.														Alta, Nev.													
Amador, Cal.														American Flag, Colo.													
Atlantic, Mich.														Astoria, Cal.													
Balsch, Nev.														Augusta, Ga.													
Belle Isle, Nev.														Augusta, bonds.													
Belle Cons., Cal.														Barcelona, Nev.													
Box & Mont., Mont.														Belmont, Colo.													
Breece, Colo.														Best & Belcher, Nev.													
Bulwer, Cal.														Bonanza King, Cal.													
Caledonia, S. Dak.														Brunswick, Cal.													
Catalpa, Colo.														Bullion, Nev.													
Chrysolite, Colo.														Burns & Bost., Mont.													
Colorado Central, Colo.														Castle Creek, Idaho.													
Commonwealth, Nev.														Chollar.													
Comstock T. bonds, Nev.														Comstock T., Nev.													
Cons. Cal. & Va., Nev.														Con. Imperial, Nev.													
Crown Point, Nev.														Con. Pacific, Cal.													
Deadwood, Dak.														Crescent, Colo.													
Enterprise.														Del Monte, Nev.													
Eureka, Cons., Nev.														El Cristo, Rep. of Col.													
Father de Smet, Dak.														Emmett, Nev.													
Freeland, Colo.														Exchequer, Nev.													
Gould & Curry, Nev.														Independence, Nev.													
Grand Prize, Nev.														Julia, Nev.													
Hale & Norcross, Nev.														Justice, Nev.													
Honesty, Dak.														King & Pauline.													
Horn Silver, Utah.														Lacrosse, Colo.													
Independence, Nev.														Lee Basin, Colo.													
Iron Hill, Dak.														Mexican, Nev.													
Iron Silver, Colo.														Minnesota Iron.													
Leadville Cons., Colo.														Monitor, Colo.													
Little Chief, Colo.														Monte Cristo, Rep. of C.													
Martin White, Nev.														Nevada Queen, Nev.													
Moulton, Mont.														N. Standard, Cal.													
Mt. Diablo, Nev.														N. Commonwealth, Nev.													
Navajo, Nev.														Oreman, Nev.													
N. Belle Isle, Nev.														Oriental & Miller, Nev.													
Ontario, Utah.														Phoenix Lead, Colo.													
Ophir, Nev.														Phoenix of Ariz.													
Overman, Nev.														Potosi, Nev.													
Plymouth, Cal.														Rapahannock, Va.													
Quicksilver, Pref. Cal.														S. Sebastian, S. Cal.													
Quincy, Mich.														Santiago.													
Robinson Cons., Colo.														Scorpion, Nev.													
Savage, Nev.														Seg. Belcher, Nev.													
Sierra Nevada, Nev.														Shoshone, Idaho.													
Silver Cord, Colo.														Silver Hill, Nev.													
Silver King, Ariz.														Sullivan Cons., Dak.													
Silver Min. of L. Valley.														Sutro Tunnel, Nev.													
Small Hope, Colo.														Syndicate, Cal.													
Standard Cons., Cal.														Tornado Cons., Nev.													
Yellow Jacket, Nev.														Union Cons., Nev.													
														Utah, Nev.													

*Ex-dividend. +Dealt in at New York Stock Ex. Unlisted securities. Assessment paid. 1 Assessment unpaid. Dividend shares sold, 800. Non-dividend shares sold, 500.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Sept. 1.		Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		SALES.	NAME OF COMPANY.	Sept. 1.		Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.			H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Atlantic, Mich.														Allouez, Mich.													
Bodie, Cal.														Arnold, Mich.													
Bonanza Development.														Astoria, Mich.													
Bost. & Mont., Mont.														Butte & Boston, Mont.													
Breece, Colo.														Centennial, Mich.													
Calumet & Hecla, Mich.														Colchis, N. Mex.													
Catalpa, Colo.														Copper Falls, Mich.													
Central, Mich.														Crescent, Colo.													
Cœur d'Alene, Id.														Dana, Mich.													
Cons. Cal. & Va., Nev.														Don Enrique, Mex.													
Dunkin, Colo.														Geyser, Colo.													
Eureka, Nev.														Humboldt, Mich.													
Franklin, Mich.														Humboldt, Mich.													
Honorine, Utah.														Hungarian, Mich.													
Horn Silver, Utah.														Huron, Mich.													
Kearsarge, Mich.														Mesnard, Mich.													
Lake Superior, Iron.														National, Mich.													
Little Pittsburgh.														Native, Mich.													
Minnesota Iron, Minn.														Oriental & M. Nev.													
Napa, Cal.														Phoenix, Ariz.													
Ontario, Utah.														Pontiac, Mich.													
Oscoda, Mich.														Rapahannock, Va.													
Quincy, Mich.														Santa Fe, N. Mex.													
Ridge, Mich.														Shoshone, Idaho.													
Sierra Nevada, Nev.														South Side, Mich.													
Silver King, Ariz.														Tamarack, Jr., Mich.													
Stormont, Utah.														Washington, Mich.													
Tamarack, Mich.														Wolverine, Mich.													
Tecumseh, Mich.																											

Dividend shares sold, 2,504

Non-dividend shares sold, 806.

Total shares sold, 3,310.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

No.	Name and Location of Company.	Capital Stock.	Assessments.		Dividends.		No.	Name and Location of Company.	Capital Stock.	Assessments.	
			Total levied.	Date and amount of last.	Total paid.	Date and amount of last.				Total levied.	Date and amount of last.
5	Derbee B. Grav., g. Cal.	10,000	100,000	10	100,000	10	60,300	Aug. 1892	5,000,000	500,000	11
6	Dexter, G. S., Nev.	1,000,000	100,000	10	100,000	10	60,300	Aug. 1892	5,000,000	500,000	11
7	Dunkin, S. L., Colo.	5,000,000	200,000	25	200,000	25	1,038,670	May 1893	2,100,000	500,000	1
8	Durango, S. L., Mont.	1,000,000	200,000	5	200,000	5	850,000	May 1893	500,000	100,000	1
9	Enterprise, S. L., Colo.	2,500,000	500,000	5	500,000	5	5,017,500	Jan. 1892	1,500,000	170,000	1
10	Eureka Con., S. L., Nev.	1,000,000	100,000	100	100,000	100	1,480,000	Dec. 1889	1,000,000	250,000	4
11	Evening Star, S. L., Colo.	1,000,000	100,000	100	100,000	100	1,350,000	Apr. 1893	1,000,000	500,000	12
12	Father de Smet, G., Dak.	1,000,000	40,000	25	220,000	June 1871	1,106,000	July 1892	1,000,000	250,000	4
13	Franklin, C., Mich.	1,000,000	100,000	100	100,000	100	190,000	July 1886	1,000,000	500,000	12
14	Freeland, S. G., Colo.	5,000,000	200,000	25	200,000	25	90,000	April 1888	625,000	2,000,000	1
15	Garfield, S. L., Nev.	500,000	100,000	10	100,000	10	10,000	June 1891	1,000,000	100,000	100
16	Glengarry, S. L., Mont.	1,000,000	100,000	10	100,000	10	10,000	June 1891	1,000,000	100,000	100
17	Gold Rock, S. L., Colo.	500,000	100,000	100	100,000	100	55,000	April 1892	10,000,000	100,000	100
18	Golden Reward, S. Dak.	1,250,000	250,000	5	250,000	5	3,826,800	Oct. 1870	10,000,000	100,000	100
19	Gould & Curry, S. G., Nev.	10,000,000	100,000	100	100,000	100	495,000	Mar. 1884	10,000,000	100,000	100
20	Grand Prize, S. L., Nev.	10,000,000	100,000	100	100,000	100	38,400	Nov. 1880	10,000,000	100,000	100
21	Granite, S. L., Idaho	1,000,000	100,000	100	100,000	100	12,150,000	July 1892	2,000,000	100,000	10
22	Granite Mountain, S. Mont.	10,000,000	400,000	25	400,000	25	444,861	May 1892	1,000,000	350,000	5
23	Great Western, L. Q., Cal.	5,000,000	50,000	10	50,000	10	212,000	Nov. 1881	1,000,000	500,000	2
24	Green Mountain, G. Cal.	1,250,000	125,000	10	125,000	10	1,822,000	Aug. 1888	1,000,000	180,000	5
25	Hale & Norcross, S. Nev.	11,200,000	112,000	10	112,000	10	1,97,970	July 1886	900,000	100,000	10
26	Hecla Con., S. L., G. Mont.	1,500,000	30,000	50	30,000	50	170,000	July 1891	10,000,000	200,000	5
27	Helena & Red, S. L., Mont.	3,315,000	663,000	5	663,000	5	80,000	May 1892	12,000,000	120,000	100
28	Helena & Frisco, S. L., Idaho	2,500,000	500,000	5	500,000	5	50,000	May 1892	375,000	75,000	5
29	Helena & Victor, S. L., Mont.	1,000,000	200,000	5	200,000	5	5,000	Apr. 1886	800,000	300,000	10
30	Holmes, S. L., Nev.	10,000,000	100,000	100	100,000	100	125,000	June 1887	3,000,000	300,000	10
31	Honesty, S. L., Utah	10,000,000	100,000	100	100,000	100	483,282	July 1893	1,000,000	200,000	5
32	Honolulu, S. L., Utah	500,000	100,000	2	100,000	2	4,700,000	Mar. 1893	1,000,000	250,000	5
33	Hope, S. L., Mont.	1,000,000	100,000	10	100,000	10	247,000	Dec. 1889	1,000,000	100,000	100
34	Horn-Silver, S. L., Utah	10,000,000	400,000	25	400,000	25	5,480,000	April 1889	1,000,000	100,000	100
35	Hubert, S. L., Colo.	1,000,000	100,000	100	100,000	100	156,250	Nov. 1887	1,000,000	100,000	100
36	Idaho, S. L., Cal.	1,000,000	100,000	100	100,000	100	245,000	July 1893	2,000,000	40,000	25
37	Illinois, S. L., N. M.	100,000	100,000	1	100,000	1	2,900,000	April 1889	1,000,000	200,000	10
38	Iron Hill, S. L., Dak.	2,500,000	250,000	10	250,000	10	200,000	Jan. 1891	1,000,000	250,000	5
39	Iron Mountain, S. Mont.	5,000,000	500,000	10	500,000	10	80,000	Jan. 1890	1,000,000	1,000,000	1
40	Iron-Silver, S. L., Colo.	10,000,000	100,000	100	100,000	100	387,000	May 1892	1,000,000	200,000	5
41	Jack Rabbit, S. L., Colo.	10,000,000	100,000	100	100,000	100	1,350,000	Dec. 1888	1,000,000	50,000	25
42	Jackson, S. L., Nev.	5,000,000	50,000	100	50,000	100	5,000	Apr. 1891	1,000,000	100,000	10
43	Kearsarge, S. L., Mich.	1,000,000	100,000	25	100,000	25	316,500	Feb. 1889	5,000,000	500,000	10
44	Kennedy, S. L., Cal.	10,000,000	100,000	100	100,000	100	609,000	Jan. 1890	5,000,000	500,000	10
45	Kentuck, S. L., Nev.	2,000,000	200,000	10	200,000	10	820,000	Dec. 1890	250,000	50,000	5
46	La Plata, S. L., Colo.	4,000,000	400,000	10	400,000	10	220,000	Dec. 1891	500,000	100,000	10
47	Leadville Con., S. L., Colo.	4,000,000	400,000	10	400,000	10	1,040,000	Dec. 1891	1,000,000	100,000	10
48	Lexington, S. L., Mont.	4,000,000	400,000	10	400,000	10	140,000	Dec. 1886	1,000,000	100,000	10
49	Little Chief, S. L., Colo.	10,000,000	200,000	50	200,000	50	175,000	May 1888	5,000,000	500,000	10
50	Little Rock, S. L., Colo.	3,000,000	600,000	5	600,000	5	15,000	Apr. 1892	250,000	50,000	5
51	Maid of Erin, S. L., Utah	10,000,000	400,000	250	400,000	250	117,000	April 1892	500,000	100,000	10
52	Mammoth, S. L., Colo.	10,000,000	100,000	100	100,000	100	45,000	Oct. 1890	1,000,000	100,000	100
53	Martin White, S. L., Nev.	10,000,000	100,000	100	100,000	100	12,500	Mar. 1886	5,000,000	500,000	10
54	Mary Murphy, S. L., Colo.	350,000	100,000	101	100,000	101	2,619,075	June 1891	2,500,000	250,000	10
55	Matchless, S. L., Utah	3,000,000	300,000	10	300,000	10	925,000	Apr. 1891	2,500,000	500,000	10
56	Maxfield, S. L., Utah	3,000,000	300,000	10	300,000	10	140,000	Apr. 1891	1,000,000	100,000	10
57	Mayflower, D. gravel, Cal.	1,000,000	100,000	10	100,000	10	40,000	Oct. 1890	1,000,000	100,000	100
58	May Mazaetta, S. L., Colo.	1,000,000	100,000	1	100,000	1	20,000	Oct. 1891	1,000,000	100,000	100
59	Minas Prietas, S. L., Mex.	1,000,000	100,000	10	100,000	10	350,000	Dec. 1890	1,000,000	100,000	100
60	Minnesota, S. L., Colo.	1,000,000	100,000	25	100,000	25	1,830,000	Mar. 1892	5,000,000	500,000	10
61	Moss, S. L., Colo.	5,000,000	1,000,000	5	1,000,000	5	3,690,000	July 1893	1,000,000	100,000	100
62	Monitor, S. L., S. Dak.	2,500,000	250,000	10	250,000	10	45,000	Oct. 1890	1,000,000	100,000	100
63	Mono, S. L., Cal.	5,000,000	50,000	100	50,000	100	12,500	Mar. 1886	2,500,000	500,000	5
64	Montana, S. L., S. Mont.	3,000,000	300,000	5	300,000	5	2,619,075	June 1891	1,000,000	100,000	100
65	Morning Star, S. L., Cal.	1,000,000	100,000	10	100,000	10	925,000	Apr. 1891	1,000,000	100,000	100
66	Morning Star Drift, S. Cal.	240,000	24,000	10	24,000	10	140,000	Apr. 1891	1,000,000	100,000	100
67	Moulton, S. L., Mont.	2,000,000	400,000	5	400,000	5	410,000	Nov. 1892	1,000,000	100,000	100
68	Mr. Diabolo, S. L., Nev.	5,000,000	50,000	100	50,000	100	210,000	July 1891	1,000,000	200,000	5
69	Napa, S. L., Cal.	10,000,000	100,000	100	100,000	100	500,000	July 1893	1,000,000	100,000	100
70	Navajo, G. S., Nev.	10,000,000	100,000	100	100,000	100	220,000	April 1889	750,000	150,000	5
71	New California, S. L., Colo.	500,000	100,000	3	100,000	3	48,000	May 1890	500,000	100,000	100
72	New Guston, S. L., Colo.	500,000	100,000	3	100,000	3	1,877,500	April 1892	1,500,000	300,000	5
73	North Banner Con., S. Cal.	10,000,000	100,000	10	100,000	10	20,000	July 1891	1,000,000	100,000	100
74	North Commonw'th, S. Nev.	10,000,000	100,000	100	100,000	100	25,000	Apr. 1891	1,000,000	100,000	100
75	North Star, S. L., Cal.	1,000,000	100,000	10	100,000	10	30,000	May 1893	1,000,000	100,000	100
76	North Star Drift, S. Cal.	240,000	24,000	10	24,000	10	13,175,000	Jan. 1880	1,000,000	100,000	100
77	North Star, S. L., Cal.	1,000,000	100,000	10	100,000	10	1,565,800	Jan. 1880	1,000,000	100,000	100
78											

COAL AND COAL RAILROAD STOCKS.

NAME OF STOCKS.	Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		Sept. 8.		Sales
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Coal.					70	69	70		70		69	68	2
Balt. & Ohio.	68½	67½											1,50
do. pref.							27½	24	27½	26	24½	22	1,50
Buff. R. & P.													1,50
do. pref.													1,50
Cambria Iron.					18	17½	17½	17½	17½	17½	17½	17	5,30
Ches. & Ohio.	17½	17½											5,30
do. 1st pref.													1,45
Col. Coal.					10	9	10	9½	9½				1,45
Col. Coal.													1,45
Colorado Fuel.	20½				25	22½	24½	24½	25	24	26	24½	5,60
do. pref.													5,60
Col. H. V. & Tol.	18	17½			20½	19½	20	19½	20½	19	19½	18½	5,15
Col. L. & West.					8								2,50
Col. & H. Coal.	7½						9½	8	9½	9	9		2,50
do. pf'd.					8								2,50
Cons. Coal.													2,50
Del. & Hud. C.	137½	136½			117½	116	119½	118	116½	116½	116½	117½	2,60
Del. L. & West.					139½	138	140½	138½	139½	138½	139½	138½	12,80
Hunt. & B. Top.					33				139½				2,80
do. pref.					47½	46½	50	47½	48	47½			2,80
Lake Erie & Wes.	17½	16½			18½	18			18½				1,10
do. pref.							98	67	50	49			90
Lehigh & C. N.	68				50	47½	48	48	50	49			90
Lehigh Valley.					31½	31½	32	31	34	32½			5,40
Maryland Coal.													5,40
do. pref.													5,40
Wm. & W. Coal.					140		140½		142				5,40
New Cent. Coal.					104	102	103½	103½	104	103½	105	104	4,30
N. J. Central.	103	100			105								4,30
N. Y. L. & W.					15½	15½	15	14½	15	14½	15½	14½	10,80
N. Y. L. & W.	15½	14½			31½		30½		31½		31½		10,80
N. Y. Susq. & W.	13	12½			14	13½	14½	13½	14½	14	14		3,50
do. pref.	42½	42½											45
do. pref. new					44	43	44½	43½	44		45		2,00
N. & West.													2,00
do. pref.													2,00
Penn. Coal.													2,00
Penn. R. R.					51	50½	51	50½	51½	50½	51½	50½	3,70
Phil. & Reading	18	17½			20½	18	20½	19½	19½	18½	19½	18½	26,70
Tenn. C. & L.	15				16½	15	17½	15	14½	14½	15½	13½	8,70
do. pref.													8,70
Wheel. & L. E.	13½				13½	13	13½	13	13				1,10
do. pref.					45	41½	44½	43					1,10

Total shares sold, 110,455.

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	Sept. 2.		Sept. 4.		Sept. 5.		Sept. 6.		Sept. 7.		Sept. 8.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams Express	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	83 1/2	34 1/2
Am. Cotton Oil.	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	58 1/2	17 1/2
Am. Dist. Tel.	108	108	108	108	108	108	108	108	108	108	108	108	3 1/2
Am. Express	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	87 1/2	182 1/2
Am. Sugar Ref.	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	85 1/2	3 1/2
do. pref.	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	91 1/2	81 1/2
Edison E. Ill. Co.	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	43 1/2	7 1/2
Edison Gen. El.	23	22 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	23 1/2	1 1/2
Nat. Cord. Co.	60	60	60	60	60	60	60	60	60	60	60	60	9 1/2
do. pref.	30 1/2	29 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	30 1/2	13 1/2
Nat. Lead Co.	70 1/2	69 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	70 1/2	15 1/2
do. pref.	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	16 1/2	2 1/2
Nat. Linsed Oil.	51	51	51	51	51	51	51	51	51	51	51	51	1 1/2
U. S. Express.	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	29 1/2	8 1/2
U. S. Rubber.	72 1/2	70 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	72 1/2	1 1/2
Wells, Fargo & Western Union.	180	128	182 1/2	128 1/2	182 1/2	128 1/2	182 1/2	128 1/2	182 1/2	128 1/2	182 1/2	128 1/2	71 1/2

Total sales, 403,763.

CALIFORNIA.
San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS.					
	Sept. 1.	Sept. 2.	Sept. 3.	Sept. 4.	Sept. 5.	Sept. 6.
Alpha.....						
Alta.....			.15	.15	.10	.15
Belcher.....						
Belle Isle.....			.60	.60	.30	.35
B. & Belch.....	.35	.35	.20	.20	.20	.25
Bulwer.....	.10	.10	.15	.15	.15	.15
Chollar.....	.20	.20	.30	.30	.30	.25
Com'w'th.....						
Con.C.&V.....	1.35	1.35	1.35	1.35	1.35	1.50
Con. Pac.....		.30				
Crown Pt.....		.30				
Del Monte.....						
EurekaCon.....						
G'd & C'y.....	.25	.25	.30	.30	.30	.30
Hale & Co.....	.60	.60	.50	.50	.60	.55
High White.....						
Mexican.....	.65	.65	.60	.60	.60	.55
Mono.....						
Mr. Diablo.....						
Nava Jo.....						
North Con.....						
N. B. Little.....						
N. C. W'th.....			.85	.85	.85	.80
Ophir.....	.90	.90	.85	.85	.85	.85
Potosi.....			.10	.60	.60	.55
Real Con.....	.40	.40	.45	.45	.45	.45
Sierra Nevada.....	.30	.30	.50	.50	.50	.50
Un'N Con.....	.35	.35	.35	.35	.35	.35
Utah.....			.10	.10	.10	.10
Vel. Jack.....	.60	.60	.55	.55	.60	.50

Colorado Springs. Sept. 2.

	R'd	Asked
Anaconda Gold.....	\$12	\$14
Anchorage L'd.....	.05	
Antlers P. K. Reg.....		.10
Calumet.....		.02
Cleopatra.....	.02	.03
C. D.....	.02	.03
Cook's Peak.....		.03
Del Monte.....		.03
Enterprise.....		.04
Fanny Rawlins.....		.05
Golden Dale.....		.01
Isabella.....	.01	.06
Jeff Davis.....	.01	
Lemhi.....	.75	
Mollie Gibson.....	1.87½	1.95
Rosa.....	.0094	.01
Pharmacist.....		.16
Summit M. & M.....	.15	.16
Union.....	.03½	.05
Work.....	.02	.02
World.....		.01

MARYLAND.

COMPANY.	Bld.	Sept. 7.	Asked
Balt. & N. C.....	.....	.....	\$0.
Corrad Hill.....	.....	.....	.....
Cons. Coal.....	.....	.....	.....
Diamond Tunnel.....	.....	.....	.....
George's Creek Coal.	.....	.....	1.
Howard C. & C.	1.15	.....	.....
Lake Chrome .....	.01@.02	.....	.....
Silver Valley.....	.10	.....	.....

MONTANA

Helena.
Prices for the week ending Aug. :

Bald Butte (Mont.).....	Bid. Aske
Benton Group (Neihart), Mont.	
Combination (Phillips'b'g), Mont.	
Cumberland (Castle), Mont.	
Elizabeth (Phillips'b'g), Mont.	
Florence (Neihart).....	
Helena & Victor, Mont.	
Iron Mountain (Missoula), Mont.	
Piegan (Marysville), Mont.	
Peorman (Coeur d'Alene), Idaho	
Whitlach Union & MacIntyre.	
Yellowstone.....	

MINNESOTA.

Duluth.		Sept. 1.
LISTED STOCKS.		
	Par.	Bid. Asked.
Biwabik M. Iron Co.....	100	\$17.00 \$19.00
Cincinnati Iron Co.....	25	.30 .39
Clark Iron Co.....	100	.. .60
Cosmopolitan Iron Co.....	..	.. ..
Great Northern Min. Co.....	100	2.20 2.75
Kanawha Iron Co.....	100	.10 .25
Keystone Iron Co.....	..	.. .20
Lake Superior Iron Co.....	25	1.00 2.20
Iron Co.....	..	.. .50
Lacle Mesaba Co.....	100	.. ..
Mesaba Moun. Iron Co.....	100	10.50 15.00
Minneapolis Iron Co.....	100	.05 .20
Mountain Iron Co.....	100	45.00 60.00
Shaw Iron Co.....	100	.90 1.25
Security Land & Exp. Co.....	10	.. 16.00
Washington Iron Co.....	100	.. ..

UNLISTED STOCKS

Adams Iron Co.....	88.00	89.00
Allegheny Mining Co.....		11.00
Allegheny Iron Co.....	10	
Aurora Iron Co.....		
Buckeye Iron Co.....	100	2.50
Buffalo Land & Exp. Co.....		.50
Camden Iron Co.....		.25
Chandler Iron Co.....		40.00
Chicago Iron Co.....	100	.15
Charlestown Iron Co.....	10	.15
Champion Iron Co.....	100	.10
Cleveland Iron Co.....		
Columbia Iron Co.....	100	
Commonwealth Mining Co.....		
Cookstok Iron Co.....	100	
Darton Iron Co.....	100	
Detroit Iron Co.....	25	.01
Elmira Land & Iron Co.....		.10
Great Western Mining Co.....	100	1.10
Hall Iron Co.....		
Homestead Iron Co.....	25	.00%
Horton Mining Co.....	10	
Imp. Iron Mt. Mining Co.....		
Internat'l Development.....		22.50
Kakina Iron Co.....	25	
Keweenaw Iron Co.....	100	
Lackawanna Iron Co.....	100	.25
Macomber Mining Co.....		
McCasill Mining Co.....		.01
McKinley Iron Co.....	100	24.50
Mesaba C., L. & Ex. Co.....	10	6.00
Mesaba Chief Iron Co.....	100	1.75
Mesaba Iron Co.....		.20
Mesaba Mineral Co.....		
Minnesota Iron Co.....	42.00	55.00
Myrna Iron Co.....	10	
Northern Light Iron Co.....	100	.25
Northern Mining Iron Co.....	100	.25
Ohio Mining Co.....	100	6.00
Oneta Iron Co.....	100	
Ophir, gold.....	1.00	2.00
Pennsylvania I. & S. Co.....	100	.04
Pioneer.....		1.00
Putnam.....		.80
Rouchleau Iron Co.....	100	.20
Republic Iron Co.....	25	.30
Red Hematite Iron Co.....	100	.13
Sheridan Iron Co.....		.25
St. Louis Iron Co.....	25	.25
Stowell Iron Co.....	10	
Towanda Iron Co.....	100	1.50
Ver. & Mesaba Iron Co.....		1.00
Zenith Iron Co.....	25	1.20

MISSOURI

St. Louis.		Sept. 6.
Closing quotations:		
	Bid.	Asked.
Adams.....	\$0.40	
American & Nettle, Colo....	.25	\$0.30
Bi-Metallic, Mont.....		4.00
Elizabeth, Mont.....	.15	.20
Granite Mountain, Mont....	1.90	2.25
Hope.....		2.50
Leo.....	.01½	.02
Pat Murphy.....		
Small Hopes.....		.50

PENNSYLVANIA
Philadelphia

	Bid.	Sept. 7. Asked
Bloomington C. & C.....	...	...
Buck Mountain C.....	...	...
Cambria.....	64	...
Connellsville Gas Co.....	...	...
Edison E. Light Co.....	...	113
Excelsior B. & S.....	...	...
Locust Mt. C. & I.....	...	...
Penn. Salt.....	...	100
Penn. Steel.....	...	60@65
Penn. Gas Coal.....	.47	...
Royal Gas.....	...	...
Westmoreland C.....	51 3/4	@52

Pittsburg.

	Bid.	Asked
Bridgewater Gas Co.....	\$35.00	...
Charles Val. Gas.....	7.00	\$8.00
Enterprise Mining Co.....	45.00	...
Hidalgo Mining Co.....	1.00	...
La Noria Mining Co.....	7.75	8.35
Luster Mining Co.....	7.00	7.50
Manufacturers' Gas.....	29.60	30.00
N Y. & Clev. G. C.....	...	51.00
Ohio Valley Gas.....	...	30.00
Pennsylvania Gas.....	8.00	...
..... & P. Co.....	13.50	...
Philadelphia Co.....	20.50	20.60
South Side Gas.....	...	...
Tuna Oil.....	...	...
Wheeling Gas Co.....	...	19.00
WhouseAir Brake Co.....	115.50	118.00

London Quotations

	Aug. 31. 1893.	
	Buyer.	Seller.
	£ s. d.	£ s. d.
Alaska Treadwell,		
Alaska Ter.	1 15 0	2 0 0
Almada & Tirito, Mex.	6	9
American Belle, Colo.	1 0	1 6
Big Creek, Nev.	2 6	5 0
Bonanza Gold, Cal.	5 0	6 0
De Lamar, Idaho	14 0	15 0

	Buyer.	Seller.
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Elkhorn, Mont.....	8	8	d.	8	8	d.
Emma, Utah.....	9	0	0	10	0	0
Flagstaff, Utah.....	6	6		9	9	
Golden Gate, Cal.....	8	0		9	0	
Golden Leaf, Mont.....	2	6		23	0	
N. M.....	3			9		
Harquahala, Ariz.....	17	0		18	0	
Holcomb Valley, Cal.....	10	10		1	1	
Jackson Gold Fields.....	9			1	0	
Jay Hawk & Lone Pine, Mont.....	5	6		6	0	
Maid of Erin, Colo.....	1	3		3	9	
Mammoth Gold, Ariz.....	6			0	0	
Mescalito del Oro, Mex. P.....	3	0	0	4	0	0
Mescalito del Oro, Mex. D.....	15	0		1	5	0
New Gaston, Colo.....	6	0		7	0	
New Montana, Mont.....	1	6		2	6	
Palmarejo, Mex.....	4	1/2		7	1/2	
Pinos Altos, Mex.....	1	0		21	6	
Poorman, Idaho.....	3	9		5	3	
Rajah Gold, Can.....	4	9		6	3	
Richmond, Nev.....	7	6		7	6	
Seven Stars, Ariz.....	1	5	0	10	4	
Sierra Buttes, Cal.....	1	6	0	8	0	
South Poorman, Idaho.....	1	0	0	1	5	0
Springdale Gold, Colo.....	3	3		3	9	
United Mexican, Mex.....	2	0		3		

Paris. Aug. 24

	Franc
Belmez, Spain.....	685.00
Golden River, Cal.....	130.00
" parts.....	30.00
Laurium, Greece.....	365.00
Lexington, Mont.....	59.00
" parts.....	1.33
Niekel, New Caledonia.....	655.00
Rio Tinto, Spain.....	327.50
" oblig.....	507.50
" " 2d.....	501.25
Tharsis, Spain.....	112.50
Vielte-Montagne, Belgium.....	455.00

New York Mining Stocks

	(Latest quotations.)	Sept. 8.
	Bid.	Asked
Adams.....	.....	.....
Alice.....	0.25	0.40
Alta.....	.....	.....
Amer. Flag.....	.....	.....
Aspen.....	.....	.....
Belcher.....	.....	.....
Best & Belcher.....	0.60	.....
Bodie.....	0.10	.....
Breece.....	0.15	0.25
Brunswick.....	.....	0.25
Bulwer.....	.....	0.10
Caledonia, R. H.....	.....	0.30
Carth Creek.....	.....	.....
Chollar.....	.....	.....
Chrysolite.....	0.12	0.20
Colo. Cent. Consol.....	.....	1.00
Constock Tunnel.....	0.06	0.08
Con. C. & Va.....	1.15	.....
Crown Point.....	.....	.....
Deadwood.....	0.85	.....
El Cristo.....	.....	0.50
Enterprise.....	.....	1.00
Father De Smet.....	0.18	0.25
Gould & Curry.....	.....	.....
Hale & Nor.....	.....	.....
Holyoke.....	0.02	0.05
Horn Silver.....	2.15	.....
Iron Silver.....	.....	0.25
Kingston & Pem.....	0.10	0.15
La Crosse.....	0.03	0.05
Leadville.....	0.12	.....
Little Chief.....	0.11	.....
Phoenix Trust Co.....	0.48	0.50
Plymouth Con.....	.....	1.00
Sutro Tunnel.....	.....	0.00

ASSESSMENTS.

COMPANY.	No.	Disq. In office.	Day of sale.	Am per sh
Alh'mbra, Nev.	17	Aug. 18	Sept. 11	.2
Alpha, Nev.	60	Sept. 4	Sept. 25	.2
Anchor, Utah.	19	Aug. 23	Oct. 19	.2
Belcher, Nev.	46	Sept. 4	Sept. 25	.1
Bodie Con., Cal.	16	Aug. 28	Sept. 25	.1
B. Camas, Utah	...	Sept. 9	Oct. 9	.0
Blue Jay, Utah	...	Aug. 21	Sept. 13	.0
Br'ns'w. Co., Cal.	6	Oct. 6	Oct. 24	.0
Bulwer, Cal.	8	Aug. 31	Sept. 22	.1
Chale Creek				
Coal, Utah.	...	Aug. 26	Sept. 11	.0
Chollar, Nev.	35	Sept. 5	Sept. 26	.1
Clinton, Cal.	2	Sept. 16	Oct. 2	.1
C'nfidence, Nev.	23	Sept. 11	Oct. 2	.1
Dalton, Utah.	1	Sept. 1	Sept. 30	.0
Dora Gold, Cal.	1	Sept. 23	Oct. 25	.0
Eclipse.	5	Sept. 4	Sept. 25	.0
Evening Star,				
Cal., Nev.	10	Sept. 12	Sept. 30	.0
Excheq'r, Nev.	36	Aug. 31	Sept. 21	.1
G'd'd Belt, Utah	...	Sept. 31	Sept. 16	.0
Gray Eagle, Cal.	33	Sept. 6	Oct. 4	.0
Herold, Cal.	6	Sept. 16	Oct. 3	.0
J'ek Rabbit, Cal.	4	Sept. 15	Oct. 6	.0
Justise, Nev.	55	Sept. 5	Sept. 25	.1
Maxfield, Utah	2	Aug. 26	Sept. 11	.0
Mexican, Nev.	48	Aug. 22	Sept. 12	.2
New Basii, Cal.	23	Aug. 21	Sept. 11	.0
Ophir, Nev.	60	Sept. 4	Sept. 25	.2
Seg. Belcher & Mides, Nev.	12	Aug. 29	Sept. 18	.1
Sierra Nevada, Nev.	105	Sept. 6	Sept. 25	.2
Siskiyew, Con.				
Q'cksilv., Cal.	7	Oct. 5	Oct. 27	.0
So. Eureka, Cal.	5	Sept. 4	Sept. 29	.0
Teresa, Mex.	11	Sept. 11	Sept. 27	.1
Waterloo, Cal.	1	Sept. 6	Sept. 25	.1
Yellow Jacket, Nev.	55	Sept. 5	Oct. 9	.1

ALPHABETICAL INDEX TO ADVERTISERS.

— Indicates every other week or monthly advertisements. —

A		D		K		Q	
Abbott, Wheelock & Co.	40	Darling, L. B.	4	Kanda, Reiji	6	Quebrada R.R. Land & Copper Co., Lt.	40
Adams, John N.	4	Davis, B. C.	9	Kansas City Sm. & Ref. Co.	41	Queen & Co.	2 & 3
Adams, W. H.	4	Davis, F. M. Iron Works Co.	12 & 38	Keasby, Robert A.	5	Queen City Foundry	13
Albion Powder Co.	7	De La Boughlise, Geo.	4	Kendall, E. D.	5		
Alinsworth, Wm.	3	De La Vergne Ref. Mach. Co.	4	Kennedy, Julian	5		
Allenstown Foundry & Machine Co.	17	Denver Fire Clay Co.	2	Kerr, Mark B.	5		
Allis Co., Edw. P.	29	Denver Separator and Amalgamator	34	Koufel & Esser Co.	5		
Allison Cannon Co.	42	Detroit Copper Mining Co.	40	Keyes, W. S.	5		
Altender, Theo. & Sons	2	Dewey, Fred P.	2	Kirby, Edmund B.	5		
Am. Diamond Rock Boring Co.	42	Dickerman, Alton L.	4	Knowles Steam Pump Work	—		
American Florida Co.	13	Dickinson, Henry P.	4	Krom, S. R.	29		
American Metal Co.	24	Dickman & Mackenzie	1				
American Mining and Milling Machine Co.	33	Dimon & Adams	12 & 28				
American Ore Machinery Co.	33	Dividends	25				
American Zinc Lead Co.	40	Dixon, Joseph, Crucible Co.	15				
Andrews, A. H. & Co.	25	Donald, J. T.	4				
Arms and Explosives	7	Drummond, M. J.	15				
Arkwright & Russell	4						
Atkins, J. L.	1						
Atlantic Dynamite Co.	7						
Atlantic Mining Co.	40						
B		E		L		R	
Babcock & Wilcox Co.	13	Eddy Valve Co.	13	Lafin & Rand Powder Co.	7	Radford, Wm. H.	1
Baker & Adamson	3	Elmer & Amend	3	Lake Co., J. H. & D.	—	Rainey, W. J.	5
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Bandell, H. E.	9	Emmens, Stephen H.	4	Lau, J. H. & Co.	7	Raymond, R. M.	2
Barr Pumping Engine Co.	14	Engineering Employment Bureau	24	Lavagnino, G.	5	Reliance Steel Casting Co.	15
Bartlett, Wallace A.	6	Eureka Co.	40	Lawrence Scientific School	6	Richards & Co.	3
Becker, Christian	3	Everette, Dr. W. E.	4	Ledoux & Co.	24	Rickard, T. A.	5
Beckett Foundry & Machine Co.	33	Everhart, J. M.	2	Lee Composite Co.	17	Ricketts & Banks	24
Bennett, Marshall & Bradley	23			Leffel & Co., James	17	Roberts, A. & P. & Co.	11
Berge, J. & H.	3			Leggett, Thomas H.	5	Robinson, G. H.	23
Berlin Iron Bridge Co.	10			Lewisohn Bros.	24	Robinson & Orr	23
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Bishop, Victor & Co.	26					Rothwell, Richard P.	5
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Blake, T. A.	34						
Blandy, John F.	4						
Blauvelt, Harrington	4						
Boggs, W. R., Jr.	4						
Boss, Clarence M.	4						
Boss, M. P.	4						
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Boston & Montana Mining Co.	40						
Bradley Fertilizer Co.	33						
Brandis Sons Co.	23						
Brandt, Randolph	23						
Bristol Mfg. Co.	1						
Brodie, Walter M.	38						
Brown Hoisting & Con'g Mch. Co.	38						
Buehrer Stm. Shov'l & Dredge Co.	34						
Bullionist, The	31						
Bullock & Crenshaw	3						
Bullock, M. C. Mfg. Co.	24						
Burford, J. H.	4						
Burleigh Rock Drill Co.	42						
Burlingame, E. E.	4						
Butters, Charles	4						
C		F		M		S	
California Wire Works	38	Farish, John B.	4	Macbeth, Jas. & Co.	7	Sargent Co.	11
Cameron, A. S., Steam Pump Wks.	14	Farish, Wm. A.	4	Machinery for Sale	25	Sargent, E. H. & Co.	—
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Cary, J. Stockly	4	Foss Mfg. Co., The	15	Maynard, George W.	5	Shapleigh, W.	4
Castner & Curran	16	For Sale Advertisements	25	McDermott & Duffield	5	Shaw, Thomas	5
Cattin, Benj. R.	1	Fraser & Chalmers	30	McGowan, John H., Co.	14	Situations Wanted	22
Cazin, Franz	4	Freeland, Francis T.	4	Mechanical Gold Extractor Co.	1	Skewes, Edward	6
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Chisom, A. R. & Co.	23	Furman, H. Van F.	4	Moore, Dr. Gideon K.	3	State School of Mines	6
Chrome Steel Works	11			Moore, Samuel L. & Sons Co.	33	Steam Stone Cutter Co.	34
Chur, A. T.	17			Morris Conn't Machine & Iron Co.	25	Stein, Walter M.	6
Clark, C. H.	4			Morrison, T. J.	25	Stickney, Conyngham & Co.	16
Clark, Ellis	4			Mundt Sons	11	Stirling Co.	13
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Clinton Wire Cloth Co.	11					Sturtevant Mill Co.	32
Cochran, A. M.	23					Sullivan Machinery Co.	1 & 26
Cochran, The	23						
Colliery Engineer Co.	16						
Colliery Guardian	4						
Collins, J. H. & Sons	4						
Collins & Co.	7						
Colorado Iron Works	37						
Columbian University	6						
Consolidation Coal Co.	16						
Constant, C. L.	24						
Contracts Open	22						
Cookson & Co.	40						
Cooper, Hewitt & Co.	39						
Copeland & Bacon	32						
Copper Queen Con. Mfg. Co.	40						
Corcoran Scientific School	6						
Cordingly & Goodstein	13						
Correspondence School of Mines	6						
Cowles Electric, Smelting & Air	24						
minum Co.	24						
Coxe Bros. & Co.	16						
Crescent Insulated Wire & Cable Co.	23						
Crescent Steel Co.	11						
D		G		N		T	
Darling, L. B.	4	Gates Iron Works	31	Nevin Commission Co.	23	Tamarack Mfg. Co.	40
Davis, B. C.	9	Gelder, Bailey & Co.	9	Newberry, W. E.	5	Taylor Iron & Steel Co.	11
Davis, F. M. Iron Works Co.	12 & 38	General Electric Co.	36	New York Belting & Packing Co., Ltd.	—	Taylor, John & Co.	3
De La Boughlise, Geo.	4	Genth, F. A., Jr.	4	Nicholson, Frank	5	Taylor & Brunton	6
De La Vergne Ref. Mach. Co.	4	Godfrey, W. S.	4	Norwalk Iron Works Co.	1 & 26	Thacher Car & Construction Co.	8
Denver Fire Clay Co.	2	Gould, James H.	4			Thies, Adolph	6
Denver Separator and Amalgamator	34	Grant, E. R.	9			Thomson-Houston International Co.	38
Detroit Copper Mining Co.	40	Griffith & Wedge Co.	31			Totten & Hogg Foundry Co.	31
Dewey, Fred P.	2	Gurley, W. & L. E.	24			Trenholm, Paul C.	9
Dickerman, Alton L.	4					Trenton Iron Co.	39
Dickinson, Henry P.	4					Troemner, Henry	3
Dickman & Mackenzie	13 & 28					Turner & Coffin	14
Dimon & Adams	13 & 28					Tyler, W. S., Wire Works Co.	20
Dividends	25						
Dixon, Joseph, Crucible Co.	15						
Donald, J. T.	4						
Drummond, M. J.	15						
E		H		O		U	
Eddy Valve Co.	13	Haddock, Shonk & Co.	16	Old Well Supply Co., Ltd.	20	Union Iron Works	1 & 34
Elmer & Amend	13	Hahn, O. H.	4	Okonite Co., The, Ltd.	26		
Electrical Plant & Electrical Industry	31	Hall Bros.	4	Olcott, Eben E.	5		
El Minero Mexicano	31	Hammond, John H.	5	Ontonagon Miner, The	30		
Elmer, E. B.	16	Hampton, Wm. Huntley	5	Orford Copper Co.	24		
Emmens, Stephen H.	4	Handy & Harman	9	Orr & Sembover	12		
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Everette, Dr. W. E.	4	Harrington & King Perforat. Co.	1 & 20	Osgood, Joseph O.	6		
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F		Hartford Steam Boiler Inspection	13	Owen House	23		
Farish, John B.	4	Hartley & Graham	13				
Farish, Wm. A.	4	Harvard University	6				
Farrall Foundry & Machine Co.	4	Hasonzahl, W.	24				
Farrall, Percy L.	4	Hastings, John B.	24				
Fisco Bros.	31	Hedburg, E.	5				
Financial Times	31	Heil, Henry, Chemical Co.	3				
Fisk, W. W.	4	Heine Safety Boiler Co.	2				
Foss Mfg. Co., The	15	Heiler, Chas. S.	2				
For Sale Advertisements	25	Hendrie & Bolthoff Mfg. Co.	28				
Fraser & Chalmers	30	Hofmann, Ottokar	5				
Freeland, Francis T.	4	Hollhaugh, J. R.	5				
Freese, E. M. & Co.	17	Hollis, H. L. & Co.	24				
Frishee-Lucop Mill Co.	32	Hooker & Lawrence	5				
Fröhling, Dr. Henry	24	Hoskins, William	5				
Frue Vanner Concentrator	28	Howard & Morse	20				
Fulton, Henry	4	Hunt, C. W. Co.	8				
Fulton Engineering and Ship Build-	30	Hunt & Robertson	24				
ing Works	30	Hunt, R. W. Co.	10				
Furlong, W. H.	4	Hyde, Geo. A.	9				
Furman, H. Van F.	4						
G		I		P		V	
Gates Iron Works	31	Ihne, F. W.	5	Pacific Mining Agency & Trust Co.	28	Vanderburgh Laboratory	24
Gelder, Bailey & Co.	9	Indian Engineering	31	Page, Wm. Byrd	5	Van Sloten, Wm.	6
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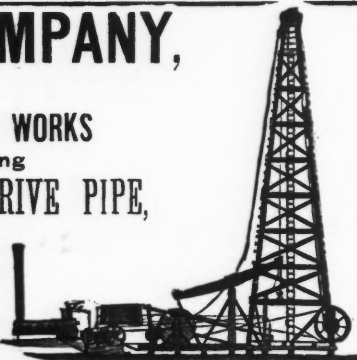
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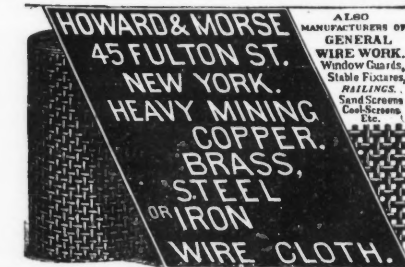
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BUILDING.—Treasury Department, Office of the Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 21st day of September, 1893, for all the labor and materials required for the erection and completion of a boiler-house and laundry building at the U. S. Marine Hospital, San Francisco, Cal., in accordance with the drawings and specification, copies of which may be had at this office or the office of the superintendent of the U. S. Marine Hospital at San Francisco, Cal. No convict labor nor any product of convict labor will be allowed in the work. Each bid must be accompanied by a certified check for a sum not less than two per cent. of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposals for the Erection and Completion of a Boiler House and Laundry Building at the U. S. Marine Hospital, San Francisco, Cal.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

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Forms of proposals and specifications can be had on application to ALFRED SPRINGER, GEO. PUCHTA and HENRY RIKHOFF, Trustees.

CABLE.—U. S. Engineer Office, Willets Point, N. Y.—Sealed proposals in duplicate will be received at this office until the 2d day of October, 1893, and opened immediately thereafter in presence of bidders, for about \$33,000 worth of submarine insulated cable, single and multiple. Specifications, instructions to bidders, and blank forms will be furnished on application to this office. W. R. KING, Lieutenant-Colonel, Corps of Engineers, U. S. A.

BRIDGE, ETC.—Sealed proposals will be received at the office of the City Clerk, Bradford, Pa., until Sept. 25, 1893, for furnishing all materials and labor and constructing the superstructure of an iron highway bridge of 60-ft. span, from center to center of end piers, 16-ft. roadway, with two six (6) foot sidewalks. Also stone abutments for the above, containing about 170 cu. yds. of masonry. Bids must be made for the bridge and abutments separately. Structures to be erected in accordance with plans and specifications on file in the office of the City Engineer. Each bid must be accompanied by a certified check for \$200, and must be on the regular printed forms. For specifications or any other information address the City Engineer or City Clerk. Councils reserve the right to reject any or all bids. JAS. A. LINDSEY, City Clerk.

DREDGING.—United States Engineer Office, Mobile, Ala.—Sealed proposals for improvement of Mobile Harbor, Ala., dredging in Mobile River, Ala., will be received at this office until September 28th, 1893, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. A. N. DAMRELL, Major of Engineers U. S. Army.

DREDGING.—U. S. Engineer Office, 537 Con- gress street, Portland, Me.—Sealed proposals for dredging in Harmsack River, Maine, will be received at this office until September 30th, 1893, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. PETER C. HAINS, Lieutenant-Colonel of Engineers.

RESERVOIR.—Sealed proposals for the erection of an impounding reservoir for the city of Altoona, Pa., on Burgoon's Run, just below their present storage basin at Kittanning Point, will be received at the office of the Altoona Board of Water Commissioners, Altoona, Pa., until the 19th day of September, 1893. Each bid must be accompanied with a certified check on a national bank for one thousand (\$1,000) dollars, made payable to the order of the chairman of the Altoona Board of Water Commissioners. Plans may be seen at the office of the board at Altoona, and specifications procured of C. A. Martin, secretary, on and after September 8th, 1893. Bids must be made upon the forms furnished for that purpose, and addressed to C. A. MARTIN, Secretary of the Altoona, Pa., Board of Water Commissioners.

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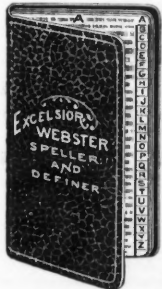
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