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CONTENTS.

Shipping Anthracite Coal to Europe . . . . . 61
Miners in the Coeur d'Alenes . . . . . 61
Cyanide Patents in Australia . . . . . 62
Mine Explosives in Great Britain . . . . . 62
The Missouri and Kansas Zinc Mines . . . . . 62
Gold Mining in Nova Scotia . . . . . 62
New Publications . . . . . 63
Books Received . . . . . 63
Correspondence . . . . . 63
Nevada Sulphur Deposits . . . . . R. L. Fulton 64
Abstracts of Official Reports . . . . . 64
Captain William Evans . . . . . 65
\* The Hammond Gold Dredge . . . . . 65
Correspondence Schools . . . . . R. P. Rothwell 65
Recent Decisions Affecting the Mining Industry . . . . . 66
\* Setting Diamond Drill Bits . . . . . 67
How the Independence Mine was Discovered . . . . . T. A. Rickard 67
British Columbia.—XIX. The Canadian Pacific Railway, from the Coast to Golden . . . . . W. M. Brewer 68
\* A Disk Roller Coal Screen . . . . . 68
Gold Mining in French Guiana . . . . . E. D. Levat 69
Fine Gold Mining and Concentration . . . . . N. J. Fleck 70
\* An Acetylene Gas Generator . . . . . 71
\* Gasoline Hoists at Mines . . . . . 71
Questions and Answers . . . . . 71
\* Patents Relating to Mining and Metallurgy . . . . . 72

Personal..... 74
Obituary..... 74
Societies and Technical Schools..... 74
Industrial Notes..... 74
Trade Catalogues..... 75
Machinery and Supplies..... 75
Mining News.
United States:
Arizona..... 75
California..... 75
Colorado..... 76
Idaho..... 77
Michigan..... 77
Missouri..... 77
Montana..... 77
Nevada..... 78
New Jersey..... 78
North Carolina..... 78
Oregon..... 78
Pennsylvania..... 78
South Dakota..... 78
Utah..... 79
Advertisers' Directory.....

The latest attempt to get up a rush of large dimensions to the San Roque Placers in Lower California has been practically a failure. A few prospectors went down there, but the number was not nearly as large as was expected. The reports sent or brought back were not especially favorable, and they were also so contradictory in their estimates of the value of the country that many who proposed to go have given up their intention. The facts, so far as they can be ascertained, do not warrant a large influx of men in the district. It seems to be the belief of prospectors who have had a great deal of experience in other districts, that only the richer deposits will pay to work, as the nature of the country, the water supply and other conditions are not favorable, and the cost of working is high. Further information is needed, however, before passing final judgment.

Under the new law now under consideration in the Spanish Cortes, which will probably be passed, the mine owners and operators of Spain will have to bear pretty heavy taxation, though in this they are only sharing the general burden put on all Spanish industries. In the first place the royalties now imposed on all mineral concessions will be increased 50 per cent., and in addition to this there will be a special tax of 3 per cent. on the gross value of all minerals extracted. An export duty will be levied on all ores or minerals exported, and to balance this a transport tax must be paid on all ores sold or shipped for domestic use. Besides this a special tax is demanded on all interest paid on coupons and on all dividends paid. This is not enough, for there is besides an elaborate system of taxes on all machines used at the mines, on all tramways and special railroads owned and used by mining companies, and on explosives used in mining.

The high price of copper has caused a boom in the Chilean copper properties, and a recent report shows that mines in that country are in demand. Prospecting for new mines is going on very actively, and some old properties, which have not been actively worked of late, are being brought forward. The production of copper in Chile has decreased largely because old methods of working and old machinery made production too costly to enable the mines to compete with those of the United States and other countries. If the boom continues, it is quite possible that production may be considerably increased during the coming year. Already several abandoned mines are being unwatered and cleared out, and several of them may be on the producing list before long. Formerly the mining law of Chile required the employment of a certain number of men in order to hold a concession, so that some laborers had to be kept, even if a mine was shut down, to prevent other parties from locating and claiming the property. Under the new mining code, however, this is not required, a yearly tax of \$10 a hectare being substituted. This change led to the entire closing of some mines on which only the obligatory work had been done for some time.

There has been some talk recently of the possibility of exporting anthracite coal to Europe, the supposition being that a demand for domestic purposes could be worked up. In view of the complete failure of past attempts of the kind, and of the difficulty involved in substituting new stoves and heaters—which would be necessary if anthracite is to be used—the success of a new effort seems exceedingly doubtful. The price, also, would be a serious objection, unless the shippers were willing to sell coal at a loss to themselves. On those terms it would be hardly worth while to built up a trade.

While some of the anthracite operators have been amusing themselves with such schemes, progress has been made in the introduction of our bituminous coal in the South American markets. This is a field which is really worth cultivating, though very little real work has been done so far. There is no reason why a very large part—if not all—of the coal now imported by South American countries from Great Britain cannot be replaced by coal from the United States. A concerted effort on the part of shippers would do a great deal toward extending the business, which has been a very profitable one to the British exporters.

A new element, which was perhaps not altogether expected, has been introduced into the situation in the Coeur d'Alenes. The members of the Miners' Union have generally refused to take out the permits required by the Governor of Idaho and the military authorities, and very few of them are at work, as no one is allowed to enter the mines during the continuance of martial law without one of these permits. Within the past few weeks, however, there has been a considerable influx of miners from other districts, who are probably attracted by the high wages paid in the district. The newcomers are from all quarters, a number of them being from the Joplin District in Missouri, others from Colorado and Utah, and a few from Montana. These men seem disposed to work and to stay, and their coming introduces a new element into the region, which may materially modify the conditions there. Of course, they are safe as long as martial law continues and

the Federal troops enforce order. It is, however, quite possible that the Union may try to drive out the new element when military protection is withdrawn, but it will probably be some time before that happens, and in the meantime the new miners may become numerous enough and well enough settled to hold their own. The new arrivals are welcomed by the mine operators, and they will probably be a factor not to be neglected in the future of the Coeur d'Alene.

The copper production of the United States during the year 1898, as collected for the "Mineral Industry," Volume VII., reaches the great total of 535,900,232 pounds (239,241 long tons). This includes the copper from all sources; that produced by the smelters of gold and silver ores, as well as that reported from the mines which are distinctively known as copper mines, and it also includes the copper in copper sulphate which is produced in many works as a by-product. As compared with 1897, this production shows an increase of 34,529,937 pounds, or 6.9 per cent. It is the largest production ever reported for the United States.

The stocks of copper reported on hand January 1st were 48,882,143 pounds, and the imports—chiefly in ore and bullion—were 38,922,552 pounds. The total supply of copper in the United States was therefore 623,704,927 pounds; but of this 299,765,054 pounds—or nearly one-half—were exported. The stocks on hand at the close of the year amounted to 54,361,470 pounds, showing that our consumption during 1898 was 269,578,403 pounds. This, like the production, was the largest quantity ever reported in one year.

As in several previous years, Montana was the largest producer, reporting a total of 216,979,334 pounds, while Michigan came second with 156,669,098 pounds. Arizona was the third producer, reporting 110,823,864 pounds. These three States therefore mined about 90 per cent. of the entire copper production of the country.

In our next issue the production will be given in detail by States and comparisons made with previous years.

#### MINE EXPLOSIVES IN GREAT BRITAIN.

The report of the Inspector of Explosives in Great Britain for 1898 says that during the year seven new factories were licensed. Altogether 128 new factories have been licensed since the act came into operation in 1876. During the same period 40 factories have ceased to exist; the net increase of factories is thus 88. The number of factories under continuing certificate remains at 39, being the same number as last year. The present number of factories under license is 104, or five more than the number at the end of 1897 (exclusive of small firework and toy firework factories).

The following have been added to the list of authorized explosives: Brain's improved electric detonator fuses; British gelignite; dynamite, No. 3; Kynoch gelignite; Kynoch's smokeless sporting powder; Maxim-Schupphaus powder; Nahnsen's gelignite; National gelignite; Oare powder; Oxalate blasting powder; Rhenish gelignite; Stowmarket carbonite; Stowmarket powder, and Sun gelignite.

The number of accidents by fire or explosion of which the department has had cognizance during the year was 194, causing, so far as is known, 52 deaths and injuring 217 persons. But, as explained in former reports, the instructions issued to inspectors of mines in 1879 relieve them from the obligation of reporting any purely mining accidents with gunpowder, except in cases where it appears to them that the accident was of a character to call for an investigation by one of the inspectors of explosives, or to afford information which seemed likely to assist these officers in the discharge of their duty. Accordingly, mining accidents with gunpowder, except when causing loss of life (when they should be reported by the coroner, or in Scotland by the procurator fiscal), or when of an exceptional character do not come under notice.

The total number of accidents shows an increase, viz., 194 against 160, and is above the average (141.2) for the last ten years. The number of deaths from accidents also shows an increase, viz., 52 against 45, and is above the decennial average (38.0). The number of persons injured last year was 217, as against 171 in 1897, and is considerably above the average (130.4). This is partly due to closer reporting of accidents. Some of these resulted from carelessness or other causes, and there were only 23 accidents, causing 18 deaths and injuring 40 persons in manufacture, storage and transport. The result shows an increase (10 to 8) in the number of persons killed compared with the previous year, and the number of persons injured also shows an increase (29 to 40).

During the year now under review three orders have been issued as to use of explosives in coal mines.

In order to obtain a place on the "Permitted List" an explosive has to pass the prescribed tests at the Government Testing Station at Woolwich, a full description of which, with plans, together with the tests, was published in the Report of the Home Office Departmental Commit-

tee. The testing station and the duty of carrying out the tests remains in the hands of the Commission.

During the year 27 tests of explosives have been carried out, which have resulted in 16 being placed on the Permitted List.

An explosive, even though it may have passed the test, may only be used provided certain conditions are observed. These conditions have in each case been referred to and approved of by the manufacturers, and are in each case practically identical with those under which the explosives passed the test.

#### THE MISSOURI AND KANSAS ZINC MINES.

In a recent issue of a trade paper appeared an editorial on the attempt of the Missouri & Kansas Zinc Miners' Association to secure a better price from the smelter interests for the output of the mines of the Joplin District. This editorial we have not space to quote in full, but in brief, while nominally supporting the miners in their attempts to get better prices, it condemns the present methods of ore production and states that "the whole leasing, mining and selling system is an economical anachronism." This statement strikes us as altogether too sweeping. The very fact that by a system of leases and sub-leases the output of lead and zinc ores from the Joplin District had risen to a total of 52,914,980 pounds of lead ore and 470,142,000 pounds of zinc ore in 1898, shows that the system must have certain advantages, and is not to be condemned hastily.

The Joplin ore bodies occur in horizontal beds of limestone of varying thickness. This limestone is covered with a varying depth of soil. Of surface indications there are very few. The ore may occur just below the soil or below 200 ft. or more of limestone. The ore bodies are of all sizes, some as large as a city "skyscraper," others containing but a few tons. The ore bodies are thickest and largest in certain areas, while the surrounding country may contain little or no ore. They are typical pockets; a stope may be all in ore one day and the next show only barren rock. Clearly there is no way in which the fee owner or the mining company can have the lands prospected and worked with so little risk as by a system of sub-leases. Only in exceptional cases would it be advisable for a company to put down a large shaft with the idea of developing considerable ground. A pocket deposit means a very large amount of dead work; again, such deposits, unless of large size, make a regular system of mining expensive. Each deposit has to be worked on its merits. Without doubt there has been wasteful mining, and some of the ore bodies could be worked by a modified caving system to greater advantage, but a small pocket of ore does not call for a large shaft.

As regards milling, however, there is room for improvement. For years a large part of the output came from hand-jigs, and to-day altogether too many of the new mills are built after an inferior model. Generally speaking, screens are not used often enough and rolls, in consequence, are not fed to the best advantage. Again, and worst of all, the loss in fine slimes is very large. In too many plants these slimes have been allowed to go to waste altogether. The remedy is, of course, to use modern appliances, for instance, Wilfley, Bartlett or Hallett concentrating tables. The old system of selling to the agents of the different smelting companies, who dickered each week for the output of the various producers, with no regard to the market price of spelter and little regard to the exact contents of the ore, is really against the interest of the miners, and for this the Missouri & Kansas Zinc Miners' Association offers an eminently fair and equitable substitute.

If Joplin methods have been crude, they have not been extravagant. Some of the companies that are buying mines at boom prices on the record of past production will do well to bear this in mind. Great economies are possible in milling, fewer in mining. It would probably pay a company to treat the ore of its sub-lessees at a large central plant, but experience gained in mining regular beds or veins may be a very deceptive guide in dealing with isolated pockets.

#### GOLD MINING IN NOVA SCOTIA.

The gold-fields of Nova Scotia have been known and worked for about 40 years with varying success, so far as individual mines were concerned, though the total yield of the Province has not varied greatly from year to year for a long period. For the most part the operations have been on a small scale and conducted with limited capital. There have been no large mines or mills, and much of the work has been done in an unsystematic way, and with little regard to the proper development of the resources of the gold-fields. There has been practically no deep mining, and until quite recently no shaft in the Province was over 300 feet in depth. The general custom in mining has been to follow the vein as long as the work paid, and when the pay-streak pinched out, was faulted or failed for any reason, to abandon the mine and look for another location.



Under these circumstances it is not strange that a general impression has arisen that Nova Scotia mines are pockety and uncertain, which does not seem to be justified by the facts. It may be noted that while there have been instances of individual loss, gold mining has generally been profitable, though, of course, in a small way, as was to be expected from the limited scale of the works. The conditions are generally favorable. There is always an abundant supply of water. The climate is good, though the winters are rather severe. Supplies and fuel are cheap and the mines are generally accessible by good roads and not far from water or railroad transportation. Labor is cheap, and though unskilled as a rule, is largely of an intelligent class which can readily learn; and labor troubles are unknown.

Within the past year or two a new element has entered into Nova Scotia mining. Several properties have been bought by companies with sufficient capital to work them on a large scale and in a thoroughly systematic way. They propose to develop their mines extensively and to explore the lower levels, which have not heretofore been touched. Under these conditions there will probably be a great extension of mining. The field will be prospected as it never has been before; and should deep mining prove successful, as seems quite probable, gold mining will become a very important industry in the Province.

The new operations will be materially aided by the excellent work of the Canadian Geological Survey. Its examinations of the Nova Scotia field have been carried on for several years and have covered a large part of the territory. Much of this work has been under charge of Mr. E. R. Faribault, who recently gave an interesting review of its progress to the Canadian Mining Institute.

The gold measures of Nova Scotia form an almost continuous belt along the Atlantic coast of the Province, 260 miles, the width varying from 10 to 75 miles. Of course this whole area is not auriferous, but gold-bearing deposits may be expected, and are found over a very large part of it. The gold measures fall naturally into two groups, the lower or quartzite, and the upper, or slate group. The beds forming these measures were originally deposited horizontally, but have been slowly moved by powerful pressure, which has folded them into a series of huge undulations, roughly parallel with the coast. Both the rich veins and the large bodies of low-grade ore follow the lines of stratification and occur at well defined points along the anticlinal axes of the folds. To locate the deposits on the surface and to develop them in depth, a knowledge of the structure of the anticlinal folds is the first necessity. The work of the Geological Survey has done much towards extending this knowledge, and will be of great service in future explorations.

Future mining in this field, it seems probable, will be of a widely different character from that which has been carried on in the past. Instead of small mines, following only the richer veins and looking for higher grade ore, there will be exploitation on a large scale, and the low grade ores will be worked extensively. There seems to be no reason why these low grade deposits cannot be made to pay well wherever they are of sufficient extent to warrant the erection of large mills. The Nova Scotia ores are free-milling, as a rule, and can be worked cheaply and with little difficulty.

Of course there is plenty of opportunity to make mistakes in this field as well as others. Proper selection of locality and development of the deposit before investing in machinery are imperative. Caution is needed, and the reckless promoter is to be avoided. There is no doubt, however, that there are chances in the field, and that the next two or three years will see extensive developments there.

#### NEW PUBLICATIONS.

"Bulletin of the American Institute of Mining Engineers, No. 1. The Progress of Mineralogy in 1898." By S. Harbert Hamilton and James R. Withrow. New York; published by the Institute. Pamphlet, pages 34.

This pamphlet represents a new departure by the Institute, which is best explained by the notice from Secretary Raymond, which accompanies it, and which is as follows: "The issue by the Institute of 'Bulletins,' of which this is the first, has been dictated by the necessity of confining within certain limits the size of the annual volumes of 'Transactions.' These bulletins will be distributed to members free, like other papers, and extra copies will be printed for sale at the Secretary's office. It is not proposed to issue them at stated times, nor will they be necessarily confined to a special character, such as bibliographic catalogues, like the present, although, obviously, such catalogues, being of value to special classes of students, are likely to be chosen for this purpose, if circumstances require the omission from the regular volume of any accepted material."

This first Bulletin is a catalogue of the contributions to mineralogical literature published during 1898, with brief notes showing the nature of the publication—whether in book form or contribution to a technical journal or the proceedings of some society—and its scope and object. The references are classified under heads, and include a wide range of publications. The list seems to be a very complete one, and will be of much service to the busy student in these days, when scientific papers appear in so many different forms and are so widely distributed that it is almost impossible to keep record or trace of them unless one

makes a special business of it and devotes much valuable time to the pursuit.

"Buchanan's Patent Crushing Rolls." Philadelphia and New York; The George V. Cresson Company. Pamphlet, pages 20; illustrated.

Issued as a "trade catalogue," this pamphlet deserves a more extended notice than would usually come under that head. Of course a considerable part of it is devoted to the description and illustration of the Buchanan rolls, which the company manufactures; but incidentally there is so much concerning the theory and practice of crushing by rolls, that it deserves a careful reading by engineers and millmen. This matter includes a brief history of the introduction and development of Cornish rolls, and some record of the work done by machines of this type. The various considerations affecting the design and construction of crushing rolls are also very clearly set forth; while the objections which have been made to their use are clearly stated and met. The pamphlet is an instance of the way in which the trade catalogue may be made worth preserving for reference; it is not the only one of its kind, since many manufacturers work on similar lines, but it is a very good example.

"Pennsylvania Avenue Subway and Tunnel." By George S. Webster. Philadelphia; Reprinted from the "Proceedings" of the Engineers' Club of Philadelphia. Pamphlet, pages 32; illustrated.

This is an interesting monograph, describing the important works now in progress to separate the grade of the Philadelphia & Reading Railroad tracks in Philadelphia from that of a number of important streets. The work includes 2,711 ft. of tunnel, 6,330 ft. of walled open subway and 959 ft. of elevated road. The location and construction of the tunnel and subway presented a number of difficult problems in engineering, as numerous sewers, water and gas pipe lines intersected and must be provided for, while the foundations of a number of large buildings adjoining the track must be carefully attended to, so that the property shall suffer no damage. How the various difficulties are met and overcome Mr. Webster tells in this monograph, with the help of a number of photographs and drawings, the latter showing the plans, and the former the progress and present condition of the work. The descriptions will be of service to many engineers who are confronted now, or are likely to be, with similar problems. The relations of railroads to cities and the relocation of tracks in crowded towns have become, in fact, the most difficult questions with which engineers have to deal; and any experience on these points should be put on record, as Mr. Webster has done in this case.

#### 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 on another page of the Journal.

"List of Beacons, Buoys and Day-Marks in the Third Light-house District." Washington; Government Printing Office. Pages, 152.

"Blue Book of American Shipping: Marine and Naval Directory of the United States." Cleveland, Ohio; The "Marine Review" Publishing Company. Pages, 444; illustrated. Price, \$5.

"Transactions of the Institution of Mining Engineers: Indices of the Names of Authors and Subjects, Volume I—X; 1889-1896." Compiled by M. Walton Brown, Secretary. Newcastle-upon-Tyne, Great Britain; published for the Institution. Pages, 64; price (in New York), \$1.75.

#### 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 will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR

We do not hold ourselves responsible for the opinions expressed by correspondents

#### Working Antimony Ores.

Sir:—We have large quantities of antimony ore of rather low grade, although in other respects it is a good sulphide ore and free from the usual objectionable compounds. The difficulty is to find a process suitable for treating this kind of antimony ore, which, owing to the fineness of the grain of the contained antimony sulphide, and the inability of ordinary methods to extract all the antimony from it, demands some special mode of treatment.

We shall be very glad if any of your correspondents can give us any information that will enable us to deal satisfactorily with this ore. We are told that a process similar to the Bartlett process for poor lead ores would possibly apply satisfactorily to this rocky antimony ore.

London, June 10, 1899.

H. C.

[We shall be pleased to hear from any of our readers who may have some process to suggest. It is, however, rather a case in which a skilled metallurgist should be consulted.—Editor E. & M. J.]

THE DEMENGE STEEL PROCESS.—The Demenge process of hardening steel ingots, which is in use at one of the principal steel works of France, consists in directly carburizing one of the faces of the ingot, at the time of casting, by lining one of the vertical sides of the mould with carburizing substances. The carburizing action is prevented from penetrating too deeply into the inside of the ingot by casting the vertical side opposite to the carburizing side. The case-hardened surface is rather rough; but all irregularity disappears in forging, which may be effected without special precaution, and at a comparatively low temperature, by the press. Ingots of 500 kgs. to 3 tons have been cast in this manner; and a 3-ton ingot, 16 in. thick, reduced by forging and rolling to one-fourth that thickness, was found to contain from 1.78 to 1.5 per cent. of carbon between its hard surface and a depth of 4.5 mm.; from 0.60 to 0.40 per cent. between 25 and 50 mm. from the surface and from 0.35 to 0.15 per cent. between 80 and 100 mm.

## NEVADA SULPHUR DEPOSITS.

Written for the Engineering and Mining Journal by R. L. Fulton.

Among the minerals found in Nevada, sulphur is one of the most abundant, though little has been thus far known or written about it. In the year 1875 J. W. Rover of Oakland came over to examine a small body of sulphur found about a half mile from the Humboldt House, a well known station on the Central Pacific Railroad. While he was at work enlarging the hole in which the deposit was found a Piute, known as Indian George, sauntered up and said he knew where plenty of that stuff was. Rover gave ear, and in a short time was led by the Indian to Rabbit Hole, 32 miles north of Humboldt House, on the edge of Black Rock Desert, where, sure enough, there was sulphur and to spare. The discovery was an unhappy one for Rover, however. His associates were one McWorthy and I. N. Sharp, who filed a location, leaving Rover's name out. The latter was incensed, and when Sharp disappeared on April 7th, 1875, he was suspected of murder. Sharp's body was found a few days later scattered over a wide space, the trunk buried in one place, one leg in another, the head in a third, and so on, and after a long legal contest Rover was hanged in Reno on February 19th, 1878.

The claim never paid and another located by C. Wright on the end of a sharp hog-back a couple of miles away was opened up with parties named Hale and Duffy as capitalists. They put in a furnace and while sulphur was worth \$60 a ton they kept it running. Later the whole works were abandoned owing to competition with foreign shipments, and lay idle until the late Alex. Wise of Winnemucca took hold of it and shipped more or less until he died. The First National Bank of Winnemucca fell heir to it under an \$8,000 mortgage, and put in as much more to get it running properly, but after one or two seasons sold it for \$30,000 to the National Sulphur Company of St. Louis, which now has it bonded for \$100,000 to other parties.

The product is obtained by tunnels and drifts run from the level of a wagon road which runs entirely around the hill at a good elevation above the valley. It is found in masses mixed with clay among heaps and layers of ashes and light gravel. The adjoining rocks are black, slaty marl and limestone. The ore occurs in blocks or chunks from a few ounces to hundreds of pounds in size. Where blasting is necessary great care is exercised, as every shot fires the mine. The material is taken to the warehouse, where it goes, four tons at a time, into the retort, where dry steam is turned on. The fuel used is Colorado coal, though cedar wood can be found not far away; sage-brush, also, is at hand, but neither answers the purpose as well as coal.

It was once supposed that the deposit was exhausted, but now it is known that it extends for miles. About 400 tons a month went to the powder factories and acid works of San Francisco during 1898 and now the shipments are 300 tons a month, with a record of 500 tons. The road crosses the Antelope range of hills and is quite heavy in places, but nearly a ton to the animal can be hauled. It is a good winter road and entirely practicable for a steam wagon or a railroad line.

Nature shows strange phases in these great deserts. This ridge is plainly volcanic, a part of the southern rim of that vast deposit which extends six or seven hundred miles north, reaching away into the State of Washington, culminating in Mt. Shasta, Mt. Hood and lesser peaks. About ½ mile north of the sulphur mine lies a bed of soda which can be plowed up and scraped together by the wagon load. It is taken up and hauled to the borax fields, 100 miles northwest on the further edge of Black Rock Flat. This is itself one of the most curious of nature's handiworks. A dead level of black, hard floor extends for miles without a tree, a rock or a shrub. The few springs found on its edge are hot and impregnated with sulphuretted hydrogen.

The Devil's Corral is a deep pit not far from the sulphur deposit, which is full of ashes and cinders, as though a fire had burned for ages. It is 200 ft. long by 80 ft. wide and very deep. The settlers think that lightning set the sulphur on fire and it burned out the best body that was in the hill. It forms a very striking feature in a strange and weird landscape.

## ABSTRACTS OF OFFICIAL REPORTS.

## Alaska United Gold Mining Company, Alaska.

This company is the youngest of the three now working on the great deposit of low-grade ore on Douglas Island, Alaska. It owns two properties, the Ready Bullion and the 700-ft. claim. On the latter only development work was done during the year covered by the report—the year ending December 31st, 1898—and no ore was crushed. On the Ready Bullion the mill was started up November 15th and in 43 days' running crushed 19,612 tons of ore. The results obtained were as follows:

	Total.	Per ton.
Free gold from mill.....	\$47,496	\$2.4217
Interest received.....	1,312	0.0669
<b>Total receipts .....</b>	<b>\$48,808</b>	<b>\$2.4886</b>
Mining ore.....	\$16,146	\$0.8233
Milling and concentrating .....	8,164	0.4162
General expenses, Douglas Island.....	443	0.0226
San Francisco .....	131	0.0067
Freight, insurance, etc., on bullion.....	512	0.0261
<b>Total expenses .....</b>	<b>\$25,396</b>	<b>\$1.2949</b>
<b>Net earnings .....</b>	<b>\$23,412</b>	<b>\$1.1937</b>

In addition to the returns given above the company had on hand at the close of the year 400 tons of concentrates (sulphurets) saved for treatment. The average value of these was \$72 a ton, or \$28,800 in all. This would increase the average return to \$3.96.

The total expenditure on the entire property to the end of the year was \$1,110,829. The capital stock is \$1,000,000 in \$5 shares; 901,000 shares have been issued and 99,000 shares are held in the treasury.

During the year on the Ready Bullion Mine the main shaft was sunk 602 ft. and there was 2,112 ft. drifts, cross-cuts, chutes and raises made;

515 ft. being on the adit level, 493 ft. on the 300 ft. level, 1,054 ft. on the 450-ft. level and 40 ft. on the 600-ft. level. The quantity of ore in sight on December 31st was 278,000 tons.

The superintendent's report says of this mine: "During the past year there has been a 120-stamp mill erected, the stamps weighing 1,050 lbs. each. This mill was framed on Puget Sound, and only the very best Oregon pine was used in its construction. The foundation for the mill is constructed on different lines from the ordinary practice here. Instead of using mortar blocks of wood, we put in a very heavy concrete foundation, about 8 ft. wide at the base and extending the entire length of the mill. Upon this concrete foundation, under each five stamps, we placed a cast-iron anvil block weighing about 7 tons. This block was bolted securely to the concrete foundation, the top of the block being planned to receive the mortar. This arrangement does away with the possibility of the foundation decaying or rotting out, as it does in mills where the wooden mortar blocks are used, the life of a wooden mortar block being only of about 10 years' duration. This mill has 48 Frue vanners, 6-ft., that is, two vanners for each five stamps. In this mill we have made a change from the former practice here by using manganese steel tables instead of cast-iron tables for our ore-feeders, and by using Blanton fasteners for our cams and cam shaft pulleys; a great improvement over the old method of fastening cams by keys. We started crushing ore November 15th, and during the 47 days elapsed the mill ran 43 days, crushing 19,612 tons of ore. Power plant consists of an 18 by 30 by 48 cross-compound surface condensing Corliss engine, with the necessary condensing apparatus. We have installed a very complete boiler plant, consisting of four boilers of the Heine make of 202 H. P. each. Our experience here with this type of boiler has been very satisfactory. The old 240-stamp mill at the Treadwell has always used this type of boiler, and we have found them very economical in fuel and requiring very little repair. We have also installed a Riedler compressor, which has a capacity of 40 air drills. Compressor is run by a cross-compound condensing Corliss engine of the latest type. This plant is very complete in every particular."

On the 700-ft. claim the development work done during the year consisted in 281 ft. sinking on the main shaft, and 928 ft. of drives and cross-cuts; 454 ft. of these being on the adit level, 280 ft. on the 150-ft. level, and 198 ft. on the 260-ft. level. At the close of the year it was estimated that there were 280,000 tons of ore in sight. The superintendent's report says: "The shaft on this mine is a three-compartment vertical one. If the vein continues of the present dip, we should intersect it with shaft at a vertical depth of between 600 and 700 ft. This shaft is equipped with a head gear, ore bins, and a rock crusher of a capacity of crushing 50 tons per hour. We also have winding engines that will work the mine to a depth of 1,000 ft. The mill on this mine consists of 100 stamps of the same weight, and built on much the same lines as the Ready Bullion Mill, with a crushing capacity of nearly 4 tons per stamp per day of 24 hours. At the present time we only have water power for this mill, as we considered it advisable to start with water power alone, and if, after a few months' experience, we found everything satisfactory, a steam plant would be installed."

IRON ORE IN ELBA.—The Island of Elba exported 228,249 tons of iron ore in 1898. Great Britain took 110,000 tons, Germany 72,000, France 28,000, and Italy 17,000 tons.

MANGANESE ORE IN JAPAN.—Under date of May 17th, 1899, United States Consul-General Gowey, of Yokohama, writes in part as follows: "Cargoes of Japanese ore do not run evenly, analyses showing a range of fineness from 28 to 70 per cent., the average being 55 or 60 per cent. Some shipments, of course, have exceeded these grades, but the impression here is that there is always uncertainty in placing an order. Details as to prices, etc., might be obtained from the American Trading Company or Messrs. Browne & Co., Yokohama, or Messrs. Howell & Co., Hakodate."

GRINDING A LARGE MIRROR.—In a recent communication to the Paris Academie des Sciences, M. P. Gautier describes the machine used for producing the large plane mirror to be used in connection with the great siderostat telescope which is to form one of the principal attractions at the approaching Paris Exhibition. The methods used were purely mechanical. The grinding machine consisted of a heavy cast-iron frame supporting a circular table, on which was mounted the blank to be ground. The grinding apparatus consisted of a bronze disc charged with emery or other polishing material, and supported by a saddle running on two slides fixed to upright portions of the frame. To obtain satisfactory results it was necessary: 1. That the table carrying the mirror should revolve accurately. 2. That all the slides which determine the motion of the saddle should be in correct adjustment. This adjustment was effected by means of comparators reading to 1-1,000 millimeter. The mirror is now finished and is said to be of excellent quality.

MINERALS IN ASIA MINOR.—The mineral wealth of Asia Minor is very great, says the London "Mining Journal," but owing to lack of means of transport little has been done to develop it. The country is full of abandoned mines that would well pay to work under more favorable conditions. Even those that are worked are done so most wastefully. Chihachef calculated in 1837 that at least 20 per cent. of the precious metal was lost. Iron is still worked near Samsun, in what was once the country of the Chalybes, so renowned as iron workers in older times. There are chrome mines at Beyjik, and salt is worked at Changra, and got by evaporation on the shores of the great salt swamp in the center of Anatolia. The largest coal area is that of Ereğli. During the Crimean War these mines were worked to supply coal to the allied fleets, but little has been done to develop them since. The most serious obstacle to the development of Asia Minor is the absolute lack of facilities for transport. Little wonder that the mines are worked inefficiently when the machinery and produce have to be transported on ponies or camels.



CAPTAIN WILLIAM EVANS.

William Evans, for many years the trusted and highly esteemed correspondent of the "Engineering and Mining Journal" at Pittsburg, died at his home in that city July 6th, aged 82 years. His health had been failing gradually, but his last illness lasted only two days and his death was unexpected. He was probably the oldest man engaged in newspaper work in the United States, as he had been connected with papers for 65 years past.

William Evans was born in Wales in 1816. When but 11 years of age he followed his elder brother, John, to America, and for several years assisted him in his tailor shop in Pittsburg. At the same time he attended night school, and while yet in his teens left the shop and began writing river news for the Pittsburg "Commercial," starting what is believed to have been the first "river column" printed in the United States. From that time until a few years ago, when advancing age compelled him to retire, Mr. Evans furnished news of the rivers to the different Pittsburg papers. He also did much reportorial work. In addition to the river work, Mr. Evans took an interest in iron and steel markets, and early in life established a reputation as an authority on such matters. Few men understood the markets better, and his forecasts were almost invariably supported by facts later.

Always an active and a busy man, Capt. Evans died almost in harness, his last letter to the "Engineering and Mining Journal" having been mailed only two days before his death. Persistence and courage were eminently characteristic of the man, as is shown by many anecdotes which could be told of him. Thus some 14 years ago he was attacked one night near his home by two masked men. The captain was that night carrying several thousand dollars, the proceeds of a sale of property. It was late and cold, and the fight was fierce. Mr. Evans was a man of small stature, and at this time was almost 70 years of age, but he gave vigorous battle. Flooring one of the men with an iron

to a point 50 ft. away. The finer part, carrying the gold, passes through gates into additional sluices in which are arranged a system of grizzlies, riffles and burlaps for concentrating and saving the values.

That the plant is saving a high percentage of the values is perhaps best proved by the fact that it has been accepted and the final payments made after a trial run of 60 days.

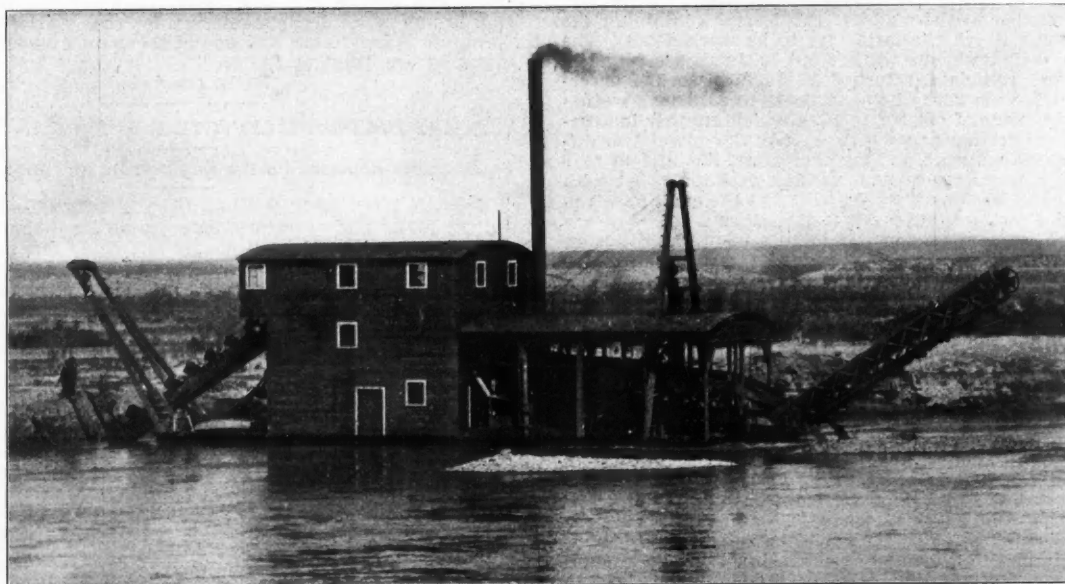
The dredge is equipped with a special system for saving the gold, and especially the fine gold, devised by Mr. I. B. Hammond. We hope to describe this method hereafter.

CORRESPONDENCE SCHOOLS.\*

By R. P. Rothwell.

Instruction by correspondence is certainly one of the most important and useful of modern educational methods. The paper on the "Scranton International Schools," by Prof. Stoek (Buffalo meeting, October, 1898), gives an elaborate description of a single private enterprise in this direction, ignoring all others, and cannot be said to present a fair or impartial view of the whole field. To supplement this deficiency, I have prepared the present paper.

There can be no doubt that this method of instruction satisfies a great and keenly recognized need on the part of those, in almost every occupation, who appreciate that knowledge is power, and that the increase of knowledge means increase in the value of service, and consequently in wages. The stoker who understands the principles of the combustion of fuel and the generation and properties of steam can quickly show his greater efficiency in reduced fuel consumption, better steam supply, fewer accidents and longer life in his boilers. If he also studies the construction and working of pumps, he qualifies himself for a higher position and larger remuneration. The charger or roustabout at



HAMMOND GOLD DREDGE AT NYSSA, OREGON.

paper weight which he had carried in his pocket, he knocked the other down with a heavy cane. His watch chain was broken in the scuffle, but he turned one of his assailants over to the police and carried his money safely home.

A hard worker and a thrifty man, Capt. Evans accumulated considerable property. His money was largely invested in real estate, and with good judgment.

In his younger days he served several years as a volunteer fireman. At that time he had quite a reputation as a singer, which he retained for many years. He was twice married and had eight children, four of whom, with his wife, survive him.

One of Capt. Evans' peculiarities was that he would never consent to have his photograph taken; and we are consequently unable to present his likeness.

THE HAMMOND GOLD DREDGE.

The accompanying illustration shows a gold dredge built by the Hammond Manufacturing Company at Portland, Oregon, which includes some recent improvements. The plant shown by the cut is now being operated at Bridge Island, on the Snake River, near Nyssa, Oregon. It is handling 2,500 cubic yards daily. The boat is 26 by 90 ft. in size and is equipped with a 55-H.P. automatic engine; a 75-H. P. boiler; a water elevator with a capacity of 3,500 gallons per minute; an electric light plant operated by a Sturtevant automatic engine; machinery for changing the position of the boat and driving the tailings elevator and buckets. This machinery is all friction driven. The cutting edges of the buckets are reinforced with plow steel ½ in. in thickness and 5 in. wide, beveled down to ¼ in. cutting edge. The chain carrying the buckets is made of steel with the best phosphor-bronze bushings and case-hardened steel pins.

This dredge will work from a point 10 ft. above water line and 20 ft. below. The material is discharged into sluices 17 ft. above the deck, where it is divided and carried to the sluices 30 ft. to the rear of the boat, the gravel and coarse material being removed by the stacker

a smelting works can similarly advance himself by acquiring a knowledge of the principles involved in the operations with which he is connected. The colliery miner who understands the composition and properties of the gases given off in coal mines, the principles of the safety lamp and ventilation, and the best means of rescue or remedy for those injured in an accident, is undoubtedly a more efficient and valuable workman than he who acts in ignorance, blunderingly following his ill-understood instructions. The men who have to do with the complicated and ingenious machinery of modern practice, especially in connection with such new agencies as electricity, can unquestionably make themselves more useful, and therefore more valuable, by acquiring special knowledge on these subjects. And how much more successful would be the vast army of sanguine, indomitable and indefatigable prospectors, which covers the mountain ranges from the Yukon to Cape Horn, if all its members were thoroughly acquainted with the origin, conditions, relations and indications of the deposits of useful minerals! It is unnecessary to multiply illustrations of this proposition. Everybody acknowledges that in this age of close industrial competition the intelligence of the workman is the secret, not only of individual advancement, but also of national industrial supremacy. It is, moreover, the most potent factor in the increase of wages, since by increasing the productive efficiency of labor it permits the payment of a larger remuneration.

As a rule, however, the wage earners in a given occupation, being dependent upon their daily labor for a living, are utterly unable to take advantage of the instruction afforded by ordinary schools, even when these offer such instruction in the special lines in which they are engaged. Sometimes, moreover, they lack the rudimentary knowledge required as a preparatory qualification for technical schools, or they have a natural dislike to the exposure of their ignorance in such respects before classes of younger, but more favored, persons.

But this is not all. Not a few persons, well grounded in general education, and even in certain branches of higher and technical training,

\*Paper read before the American Institute of Mining Engineers, New York Meeting, February, 1899.

find themselves in positions of responsibility in which they feel the need of knowledge in some special branch not included in their previous studies. This is peculiarly the case in the United States, where men of education and executive ability frequently change their special occupations. This is by no means a sign of inferiority in our system of technical organization. The personal qualities of integrity, industry, skill and experience in the management of workmen, wisdom and decision in the direction of business, etc., are really rarer and more valuable to capitalists than a mere knowledge of technical details, unaccompanied by such qualities of personal character. Hence it often happens that men of demonstrated ability are called to manage, and do successfully manage, business enterprises, the technical details of which they have yet to learn. This is especially true of the managers of mining companies, who frequently have charge of concentrating works, mills, furnaces, railroads, ditches, cable and electric lines, etc., as well as of the ordinary operations of mining. A man may be an accomplished engineer in some of these directions without having had instruction and experience in all. And such men often desire earnestly to learn, in this or that branch, at least enough to enable them to direct and judge intelligently the work of their subordinates. Yet they cannot abandon their work and go back to school for such a purpose.

To both these classes—the workmen who need to learn the rudiments of theory, and even, perhaps, to acquire the fundamental means of all technical study, such as arithmetic and the ability to interpret and to make working drawings, and also to the educated engineers who desire to fill up gaps in their knowledge—the correspondence school offers its aid. Its method of instruction may be summarized as follows, some observations and criticisms upon details being reserved for statement later in this paper.

The only indispensable prerequisite on the part of the student is the ability to read and write fairly well. All students who start from that point pursue certain courses in arithmetic, and, if necessary, in algebra and higher mathematics. This is done by means of instruction papers, and question papers mailed to the student; the former containing the principles and data upon which the latter are to be worked out. The question papers with their problems worked out in detail are returned to the school, examined, criticised, returned for further work if necessary, and so on, until the answers of the students to a given question paper exhibit a certain grade of efficiency, after which another instruction paper and another question paper follow. (At the outset two different papers of each kind are sent, so that, thereafter, the student may always have a set on hand to work upon, while a question paper with his answers is under examination at the school.) At the end of a given course thus conducted a certificate is given to the student.

The success of such instruction depends largely upon the diligence of the student, and it is directly to the business interest of the school that he should be urged to earnest work, and helped in case of difficulties or discouragements; for the diligent student is the one who makes rapid progress, feels satisfied with the results attained, pays his dues promptly and recommends the school to others, both by his good word and by his success. The constant stimulation of the student, and the small number of instruction papers given out at one time, tend to make many persons study who would turn away in despair or indifference from a ponderous volume containing all the instruction papers of a whole course, or from an ordinary text-book intended for use in the presence of a competent instructor.

It is, in my opinion, a great advantage to the new method that practically all the correspondence schools are private business enterprises, conducted for the purpose of making money. This advantage is seen in part in the rapid multiplication of such schools, and the sharp competition which is beginning to arise among them, involving an amount of vigilant criticism on the part of rivals not commonly indulged in among regular colleges and universities, which pay no dividends. Moreover, the fact that under this system the student is a customer, operates to secure for him honorable and liberal treatment. Thus all the schools allow students who have paid for a full course or scholarship to continue their studies, whether interrupted or not, so that it may be many years before they finally pass creditable examinations and receive corresponding certificates in the subjects, or instruction in which they have paid. Nearly all permit a student who is prevented from continuing a course for which he has paid the full fee, to sell or transfer his scholarship to another. In fact, the solicitors for the several schools already vie with one another, and will doubtless do so in increasing degree, as competition increases, in offering convenient and liberal terms to students.

It may be presumed that the open competition of the schools, insuring constant criticism and comparison of their instruction papers, and of the value of the instruction otherwise given, will effectually prevent any deterioration of educational efficiency. Not only will the fittest survive, but the less fit will promptly succumb under this intense competition and vigorous criticism of their rivals.

That there is a temptation to make money too quickly by devices injurious to the highest educational efficiency cannot be denied. I think this tendency has already induced, for instance, the selling of bound volumes of instruction papers, and even of "keys" to the question papers, both of which practices are to be disapproved. Such bound volumes cannot be "up to date," as it is necessary to keep the separate instruction papers in order to secure one of the great advantages of this system. And evidently the use of keys is utterly destructive of the foundation of efficient instruction and real progress on the part of the pupil under this method. The granting of certificates to unqualified pupils is another danger which has already shown itself in one, at least, of these schools. It must be remembered that in proportion as the certificates earned by earnest and honest students prove valuable to the holders as wage earners, they will be sought after by others who will not hesitate to cheat by the use of "keys" in order to obtain them.

There is also a temptation to inflation of the capital of such enterprises. The enormous increase of the capital stock of the Scranton schools, for example—from \$100,000 to \$1,250,000 in seven years—is soon followed by the announcement of a further increase to \$1,500,000. In this instance every new issue of stock has been sold for cash at par, and

the money has gone in some way into the business, from which large dividends have been paid. But a business of this kind is peculiarly liable to self-deception in bookkeeping. New capital may be invested in replacing plant already representing former capital; and the regular balance sheet may thus come to overstate the real assets. A paid-up capital, a large amount of which is represented by such items as "good will" or "earning power," is a snare into which stock companies too often fall; and the increase of capital by "construction" and "improvement" accounts which should have been carried on as part of current expenses, has been notoriously the cause of disaster to innumerable railroad and manufacturing companies. The desire to pay large dividends is acknowledged to have been the cause of such fallacious bookkeeping. So far as the Scranton schools are concerned, it is, of course, primarily the business of the stockholders in that company to look after their own property, and if they are satisfied no one else is responsible. But from the standpoint of the friends of the correspondence system of education it is permissible to express the belief that this particular enterprise is excessively and unwisely over-capitalized, and that such a course invites evil results which would discredit, however unjustly, the whole correspondence system.

The rapid expansion of the Scranton schools, proving as it did the public appreciation of the correspondence method, has led to the establishment of many such enterprises, of which I propose to give a brief account. No doubt others will spring up; and some among them will probably be mere catchpenny schemes, like the notorious "paper" medical and other colleges. But those which I shall name are, so far as I know, conducted efficiently and in good faith.

The claim is advanced by some of them that their papers and methods are improvements upon those of the Scranton schools; and it is reasonable to suppose that in such a competition the later comer may have taken advantage of the experience of his predecessors and adopted features which are, for the time being, at least, superior. It may safely be assumed that not one of the correspondence schools has yet reached perfection in any of its departments, or, for that matter, ever will do so; for progress is inevitable, and one of the claims made for these schools is that they are "kept up to date."

(To be concluded.)

#### RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

**CONSTRUCTION OF RELEASE ON OIL LEASE.**—An agreement between the lessor and operators under an oil lease that in consideration that the lessors relinquish all money stipulated for, for the location of additional wells within a stated time, the operator agreed to drill additional wells within a time stated, was an executed release of location moneys under the former contract; and not merely a conditional one, which remained executory until the new wells were drilled within the time limited.—*Meeker vs. Browning* (9 Ohio Circuit Reports, 108); Ohio Circuit Court.

**WHEN NOT LIABLE FOR GAS NOT USED.**—Under a contract granting an operating company the right to oil and gas in place in land, on the stipulation that, if gas only should be found, the company would pay a fixed sum per year for each well "while the same is being used off the premises," and containing no stipulation inconsistent with same, the company is not required to pay such sum for a gas well whose product is not used, even though it might have been used off the premises without loss to the company.—*Ohio Oil Company vs. Lane* (52 North-eastern Reporter, 791); Supreme Court of Ohio.

**NEGLIGENCE MUST BE "WILLFUL."**—Where the mine foreman, in Illinois, examined the mine shortly after the men went to work, and before the accident occurred by which one of the miners lost his life, the fact that the examination was not made before the men went to work, as provided by the laws of Illinois (Hurd's Statutes, 1898, page 1,091), will not render the mine owner liable, as section 14 of the law provides that the omission to comply with its provisions shall create a liability only if "willful."—*Missouri & Illinois Coal Company vs. Schwalb* (77 Appellate Court Reporter, 593); Appellate Court of Illinois.

**SUBLETTING OF MINING LEASE IN COLORADO.**—The assignee of a mining lease, who was to work the claim and pay for same the net proceeds up to a certain sum, failed to realize profits and permitted another to work the mine with the same understanding, but he also failed to realize profits. The assignment did not forbid subletting, nor require continuous working. The court held that the assignee's letting another work was not a putting it out of his power to comply with his contract, so as to make him liable, under the laws of Colorado, as if he had carried it out.—*Caley vs. Portland* (56 Pacific Reporter, 350); Court of Appeals of Colorado.

**WHEN FAILURE TO OPERATE TERMINATES OIL LEASE.**—A land owner executed an oil and gas lease, with the right to drill wells and operate them in consideration of an agreed division of the product. There was a condition that if no well should be completed within a year from the date of the lease it should be void, unless the lessee should pay a certain agreed sum for each year during which completion was delayed. The court held that a failure to complete the wells during the year and an omission to pay the sum agreed on avoided the lease without an election on the part of the owner to so terminate it.—*Kenton Gas & Electric Company vs. Dorney* (17 Ohio Circuit Court Reporter, 101); Ohio Circuit Court.

An assignee of an oil lease providing that a well should be completed within a certain time, and, if not, that a certain sum should be paid for each year during which completion was delayed, is not liable for the payment of such sum, where he assigned the lease before the expiration of the year.—*Watt vs. Equitable Gas Company*; Superior Court of Pennsylvania.



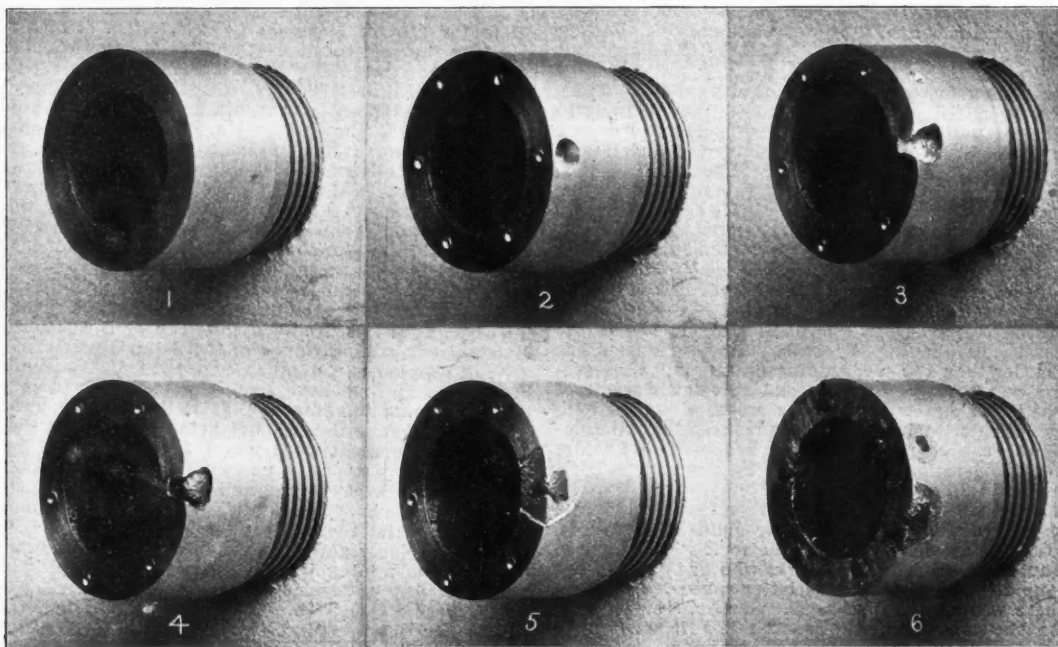
## SETTING DIAMOND DRILL BITS.

In the catalogue recently issued by the Sullivan Machinery Company of Chicago there are given some instructions for setting diamond drill bits which are so practical and so much to the point that they deserve general circulation, and we give them below. They were written, of course, especially for the company's drills, but have a general application. They were originally prepared, with the accompanying illustrations, by Mr. J. Parke Channing. The instructions are as follows:

For the "E" size bit 6 diamonds are used, and 8 for the "A" size, or larger. When the rock is extremely hard, two extra diamonds are set on the outside of the bit and directly opposite each other (Fig. 6); these assist those on the outer edge of the face in retaining the diameter or size as first set. All bits should be set so as to be the same outside and inside diameter as the first one used.

The diamonds are set alternately (Fig. 6); those on the outside cover the outer half of the face, and cut the outside clearance, while those on the inside cover the inner half of the face, and cut the inside clearance for the core to pass up freely.

After screwing the blank bit (Fig. 1) into the setting block, the first step is to divide the bit into 6 or 8 equal parts, according to the number of diamonds to be used, and mark with center punch (Fig. 2) where they are to be placed. The breast drill and twist bits are then used to bore a horizontal hole in the side of the bit (Fig. 2); each diamond should be studied separately and the holes bored in proportion to their size. As the outside diamonds can be more conveniently set than those on the inside, the largest should be selected for this purpose, and set first. Horizontal holes are used for the outside diamonds and vertical holes for those on the inside of the bit. After boring, the hole is chipped out by small chisels until the diamond fits very snugly in the metal (Figs. 3 and 4) and projects 1-64 in. above the face, and the same distance from the outside and inside rim of the bit.



SETTING DIAMOND DRILL BITS.

When the diamond is fitted in place and the proper measurement obtained, the metal is drawn up or closed around it (Fig. 5); this is done by first making a cut with a blunt-edged chisel across the face of the bit about  $\frac{1}{8}$  in. from each side of the diamond and all around it on the outer surface (Fig. 5); then by using a dull-pointed chisel or calking tool, the metal is gradually driven towards the diamond.

In order to get the diamond placed to the best advantage, it is often necessary to cut away more metal than it is possible to replace by driving up the original metal on the bit; in such cases, thin wedges, made of horse shoe nails, or copper wire hammered flat or wedge shape, should be used to fill up the space around the diamond before the calking takes place. The setter should endeavor to place the diamond in such a position that it will have a sharp cutting edge on the face of the bit and at the same time leave a broad strong side or surface for the clearance on the outside of the bit (Fig. 4), which will insure against much reduction in size of the bit.

The diamond should be held in place by the third finger of the left hand, and the chisel or calking tool held between the thumb and first and second fingers. First drive up the metal on the face of the bit until it holds the diamond in its proper position; then the calking on the sides can be done. Care should be taken that the diamond does not move from its proper position, thereby destroying the gauge or measurement. When the metal begins to bear on the diamond, a finer pointed tool should be used, light blows struck, and the metal closed in carefully around it. It is possible to break the diamond by calking the metal too tightly, and also by driving the metal to fill an opening near the corner of the diamond, while the metal may be pressing hard on it at another point; it is, therefore, necessary to drive the metal so that it will be brought to press uniformly all around.

Whenever the drill is withdrawn from the hole the bit should always be carefully examined, and if any of the diamonds are found to be loose or the metal worn away so as to leave some of them unprotected, the

metal should be recalked around them. (By "recalking" we mean to close in the metal.) When the bit is so badly worn that the diamonds are greatly exposed, they should be cut out and reset in a new metal blank.

If, while drilling, some of the outside diamonds are broken, so that the size of the hole is reduced, when the next bit is introduced that portion of the hole bored after the diamonds were broken should be re-bored so as to be the full size of the standard bit, as any attempt to force the new bit down into the reduced hole, either by trying to turn the rods with tongs or otherwise, will be sure to destroy the outside diamonds.

To remove the diamonds from an old bit make a cut across the face of the bit about  $\frac{1}{8}$  in. from each side of the diamond with a hack saw or file; then with a chisel drive the metal back and chip it away, until the diamond can be forced out by light taps of the hammer on a small copper rod.

The diamond-setting tools are as follows: One  $3\frac{1}{4}$ -in. jaw vise, with swiveled base, one breast drill with five twist bits, size  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in., each varying 1-32 in. from the next, one set of 12 setting chisels and punches, one light hammer, one pair 6-in. dividers, one pair 6-in. inside calipers, one pair 6-in. outside calipers, one setting block or chuck, for holding the bit while setting.

## HOW THE INDEPENDENCE MINE WAS DISCOVERED.

Written for the Engineering and Mining Journal by T. A. Rickard.

In May, 1891, F. F. Frisbee and Edward De La Vergne happened to meet W. S. Stratton at Colorado Springs. The two former had been prospecting in the Cripple Creek District during the preceding winter. Stratton was at that time a carpenter and builder by trade, but he had for many years been in the habit of prospecting in the intervals of his

regular occupation; he had learned the use of the blow-pipe and was familiar with the elements of mineralogy and geology; he was, in fact, an energetic, well-informed man, well equipped for prospecting work of any kind. At this particular period he was engaged in a search for the mineral cryolite, which, as the chief source of aluminum, was then in active demand. His camp was on the Little Beaver, on the west side of Pike's Peak, toward Cripple Creek. When he met Frisbee and De La Vergne, they exhibited the results of assays from samples brought down by them from their claims near the Bennett and Myers ranch, the site of the present town of Cripple Creek. The results were so encouraging that Stratton went up to see the district and there met Bob Womack, who took him to see what work had been done. Robert Womack was, without much design on his part, the discoverer of Cripple Creek. He once owned a small ranch in the district, but it became absorbed among the larger holdings of Bennett and Myers, the proprietors of the cattle range which, in the years before the gold was found, extended over the sunny hills lying on the southward slope of Pike's Peak.

Womack took Stratton to see his prospect in Poverty Gulch and accompanied him in his trips to other claims. Among the prospectors was Dick Houghton, an old mountaineer and specimen hunter, whose labors have enriched many museums. One day Houghton brought down a piece of ore from his claim on Gold Hill and showed it to Stratton, telling him that he found some galena. The future owner of the Independence examined it with his magnifying glass and expressed doubts upon Houghton's determination of the presence of galena. Incidentally Stratton detected several little cubes of rusty gold, one of which had become burnished by being rubbed in Houghton's pocket. The two men went to the camp and a blow-pipe test proved Stratton's surmise to be correct. Neither of them knew that the bright silvery mineral which Houghton took to be galena was sylvanite, the telluride of gold and silver. It is not recorded who first recognized the tellurides of Cripple Creek, but there is a story that a miner built a camp fire-place with

some pieces of rock which contained this mineral, and that the heat of his cooking operations roasted the ore so as to bring out the fact that it carried gold. "Si non e vero, e ben trovato."

Stratton went up Gold Hill and located a claim next to Houghton's. It was named the Gold King and is now part of the Gold & Globe property. On June 5th Stratton, accompanied by Fred Troutman, walked up the ridge above Battle Mountain, and seeing a clump of willows at the head of Wilson Creek, they descended the hill to reach the spring, the presence of which was inferred. This locality is now covered by the town of Goldfield. After getting a drink they climbed the hill to the north and found several loose pieces of rock, one of which was broken open and found to be smothered with gold. Mr. Stratton says this was the only time he became really excited. They pitched their camp near the spring the next day and began a search for the lode which had shed so rich a float. Trenches were dug. But Stratton had certain preconceived ideas, like most of us, and among them was the theory that veins having a north-south trend carried the rich ores, therefore the trenches were dug so as to cross the supposed strike of the veins, with the result, as we now know, of paralleling, instead of cutting, the lodes which existed there and subsequently became developed into the Legal Tender, Lillie, Vindicator and Christmas mines. Stratton and Troutman found nothing.

An old ranchman, Billy Fernay by name, happened along at this time and brought pieces of float which he had found on the hill below, now called Battle Mountain. Stratton liked the look of it and arranged with Fernay to locate a claim in the names of Stratton, Troutman and himself. This was the Black Diamond, now the most southern part of the large territory controlled by the Portland Mine. Next day Stratton went over to see the vein and spent some time examining the ground. He tried to make the course of the vein coincide with the line of the ridge, running north and south. This led him down the hill to a big outcrop of granite, which was the Independence lode. Many had already seen it, as the path from one ranch to another passed close by and all the cattlemen who had any idea of prospecting had examined the outcrop. Everyone had condemned it as worthless granite. Fernay pointed it out to Stratton, and he also did as the others had done; but not irretrievably.

The character of that now famous lode cropping is worthy of detailed description. It was indeed granite, decomposed, especially as to the mica, but nevertheless unlike the granite ores of other districts, such as Gilpin or Boulder. Stratton noted the scarcity of quartz and particularly the absence of any sulphides, such as galena and pyrites, with which he had been led to associate the idea of value in the lodes of the San Juan region, where he had done much prospecting. Two years later, when car-loads of this ore were sent to the smelters, the managers of these establishments at first thought that a blunder had been made and that ballast had been consigned to them in error. It required the careful examination of a trained eye to detect that the mica had been leached out, leaving iron-stained spots in which free gold might be distinguished. Of the two feldspars, microcline and oligoclase, the plagioclase variety has become kaolinised, while secondary quartz has made the lode itself harder than the surrounding granite and thus permitted it to withstand weathering. Underground this same ore is of greater beauty, because it is characterized by the presence of pink fluorite as well as by stains of chlorite due to the deep composition of the biotite. Part of the outcrop can still be seen, just below the old whim shaft, and invites the consideration of those who may wonder why it was so long overlooked.

As above stated, Stratton disregarded it, as other less experienced prospectors had previously done. Two days later John R. McKinnie, the future owner of the Moon-Anchor Mine, came to the camp and so did Charlie Love, a ranchman from Beaver Park, who had pointed out the big outcrop to many of the pioneers. The latter asked McKinnie if he had seen it and there was a brief discussion. Stratton remembered the incident when, on the morning of the Fourth of July, he was at Colorado Springs, whither he had gone with five samples for assay. The assays showed only \$3 or \$4 at the best, notwithstanding the much better results which he had obtained by panning. It suddenly occurred to him that the granite outcrop must be the lode. He had found gold by panning the loose dirt amid the fragments of porphyry lying upon the south face of Battle Mountain just below the outcrop, but he had been unable to trace the source of it to any vein in the porphyry (andesite breccia) formation. Acting upon the impulse of the moment, he took horse immediately for the mine and upon arrival found Troutman just about to leave for Colorado Springs. Stratton made two locations, the Independence and the Washington, and I doubt if any man ever celebrated a national holiday to better advantage. Some pieces of the granite outcrop were broken and Troutman took them to be assayed at the Springs, while Stratton awaited the result. Next day the assay certificate arrived and proved the ore to contain 19 oz. of gold per ton.

The rest of the story is simple. With rare good sense Stratton developed the mine as far as his means would permit and when the profits became large he expanded the scope of explorations until he succeeded in making the Independence one of the most valuable gold mines ever uncovered by the prospector's pick. Up to the time of this writing the Independence has produced a little over \$4,500,000, the average yield of the ore being 4½ oz. per ton. The net profit won exceeds \$3,000,000.

**PURIFYING WASTE GASES.**—According to Dr. H. Wedding, in a paper read before the Berlin Society of Arts, the waste gases from the iron ore calcining kilns at Kotterback, in Upper Hungary, owing to the presence of sulphurous acid and mercury vapors, injure the vegetation in the vicinity. In order to obviate this and at the same time to recover the quicksilver as a by-product, and so reduce the cost of calcination, the waste gases are collected and purified. The kilns are divided into three groups. The gases of each group are conducted through a wooden tower, in which two grates are placed. These are covered with limestone, on which water plays. The gases traverse the tower in the opposite direction to the falling water, and are thus cooled and condensed, the sulphurous anhydride being dissolved and act on the limestone. The condensed quicksilver is collected.

## BRITISH COLUMBIA.—XIX.

### THE CANADIAN PACIFIC RAILWAY, FROM THE COAST TO GOLDEN.

Special Report of W. M. Brewer, Traveling Correspondent.

A trip over the Mountain Division of the Canadian Pacific Railroad enables one to form a very fair idea of the extent and mineral resources of the Province of British Columbia, tributary to that railroad. Three ranges of mountains—the Coast, the Gold or Columbia, and the Selkirks—are crossed between the Coast and Golden, which is situated near the confluence of the Kicking Horse and Columbia rivers, with the Rockies to the east, and the Selkirks to the west. As the road follows the valleys of the Fraser, Thompson, South Thompson, Eagle, Illecilliwaet, Beaver and Columbia rivers, one hardly realizes that he crosses the summits of mountain ranges. Indeed the elevation of the summit at Eagle Pass is only 525 ft. above the Columbia River, while the summit at Roger's Pass is 4,300 ft. The latter is the summit of the Selkirk Range, and the former that of the Gold or Columbia Range.

So far as the mineral resources immediately adjacent to the line of railway are concerned, there has been practically no prospecting or development, beyond the work done in the placer diggings in the '60's, and that being carried on at present by the dredge boats on the Fraser River west from North Bend station. In fact, very little if anything is known of the country on either side of the railroad except in the districts in the Kootenays and Boundary Creek south from the railway near the international border, and Cariboo, nearly 300 miles north from the railway.

While there are no mines of any magnitude close to the main line of railway, at several points along that line branch railroads or waterways penetrate into the mining districts of the province. For instance, at Agassiz station, 65 miles east from Vancouver, a stage road branches off to the foot of Harrison Lake, 5 miles distant. This lake affords access to the mineral district of Fire Mountain and the Upper Lillooet River. At Lytton, 156 miles east from Vancouver, a stage road branches off towards Lillooet District, comprising Cayoosh Creek, Bridge River, McGilvray and Black Water mining camps. At Ashcroft, 204 miles east from Vancouver, the Cariboo stage road branches off which gives access to all the mining camps on the Upper Fraser River, the Cariboo District, Omenica, and other northern mining camps. At Sicamous Junction, 335 miles east from Vancouver, a branch railroad connects the main line with the Okanagan Lake from which is reached the Boundary Creek, Fair View, and Camp McKinney mining districts. At Revelstoke, 379 miles east from Vancouver, a branch railroad connects with Arrow Lake, which gives access to the Slocan, and West Kootenay, as well as the Trout River, and Lardeau mining districts. At Golden, connection is made with the Upper Columbia River, which gives access to the mining districts of East Kootenay, the Crow's Nest Pass coal-fields, and McMurdo Creek mining camps in the Selkirk Range.

Near Kamloops, 251 miles east from Vancouver, mining operations of some magnitude have been carried on for some years past. These include mining for cinnabar, as well as for copper-gold ores. At the cinnabar mines, which are not being operated at the present, quite extensive development work was done, and a plant for treating ore, and producing mercury on a commercial scale, was installed in 1896 and 1897. The works were not well constructed and lost most of the mercury, but there is evidence to show that large amounts of ore of profitable grade exist there. On Jamieson Creek, 18 miles north from Kamloops, placer and dredge mining are being prosecuted. The chief drawback to mining in this district is apparently the lack of capital by prospectors to develop their claims.

The great difficulty in British Columbia to-day, and one of the main causes why more capital does not become interested in the mines, is that when capitalists send their agents to investigate they cannot find any properties sufficiently developed to warrant them being considered as mines. It is almost impossible to persuade the prospectors that one developed prospect is of more value than a hundred claims, with nothing but the stakes to show on them. In fact, the only criticism that could very well be made against the mining laws of British Columbia is, that they permit indiscriminate staking and re-staking instead of compelling locators to do actual development work.

Near Illecilliwaet, 407 miles east from Vancouver, are located the properties known as the Lanark and Waverley groups, on which considerable money has been spent, and a plant for concentrating erected. At the present time the companies have apparently suspended operations, and the concentrator stands by the side of the railway deserted, while the houses erected for the employees have apparently been abandoned to the rats and weather. The reason for this abandonment the writer is unable to give, because of lack of opportunity to make any examination of the properties.

At Golden a smelter was erected some years since, but has never been blown in. This fact, though, should not be considered in connection with the prospects of the mines, for the simple reason that the smelter was erected to boom a town site scheme, and that the promoters of the enterprise could hardly have even persuaded themselves that the machinery would run, because at the time of its construction practically nothing whatever was known of the mineral resources tributary to the place. It is doubtful if it ever will blow in, because the coal-fields of the Crow's Nest Pass may make it very much more advantageous for the mines of the East Kootenay District to look to that section for smelting facilities than to Golden.

During the writer's visit to this section a stampede was in progress to some new placer diggings, discovered on Swift Current River in the Tete Jaune Cache District, about 180 miles north from Donald, which is 458 miles east from Vancouver. But little will be known of the results of this stampede until late in the fall, because, owing to the conditions of the water in the Swift Current River, the mining district has been laid over by the Gold Commissioner at Golden until next September. However, some 50 or 60 placer miners have already gone in to locate



vacant ground, and if any credence can be placed in the reports brought from this district last fall there is some very fair placer ground.

Owing to the high water in the Fraser River, the dredge boats near North Bend and Ruby Creek are both idle at the present time. The plant near North Bend has been run successfully now during two seasons, and from its construction and general design—a description of which was published in the "Engineering and Mining Journal" June 11th, 1898, page, 699—is probably better calculated for successful operations than any other in the Province.

**A DISK ROLLER COAL SCREEN.**

The accompanying illustrations show Bray's eccentric disk roller screen, a new pattern, which is now being introduced for screening coal. It is adapted for almost any kind of bituminous coal, and can be used also for anthracite. It is in successful use as a triple screen for bituminous coal; and has also been employed in coal pockets for grading. It is made by the Borden & Selleck Company, of Chicago.

In the illustration Fig. 1 is a plan view of the screen. Fig. 2 is an enlarged section of the shaft and disk.

This screen can be made of any capacity needed, and, it is claimed, grades and separates without breakage and without clogging. It will be noticed that the serrated disks are mounted on shafts and that the spacing between each is graduated in size. An important feature is that the disks are mounted eccentrically upon the shafts so that as they

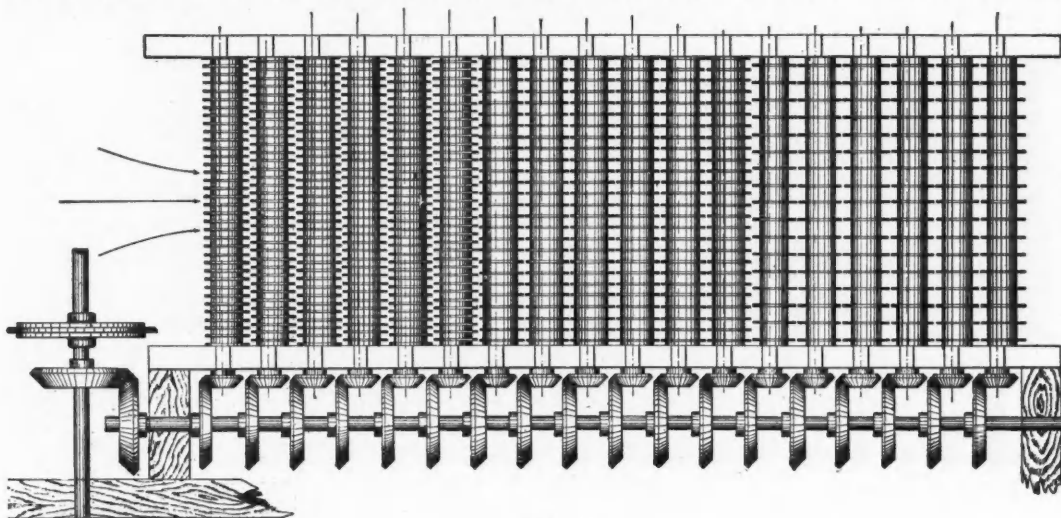


FIG. 1.

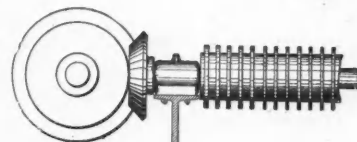


FIG. 2.

BORDEN & SELLECK ROLLER SCREEN FOR COAL.

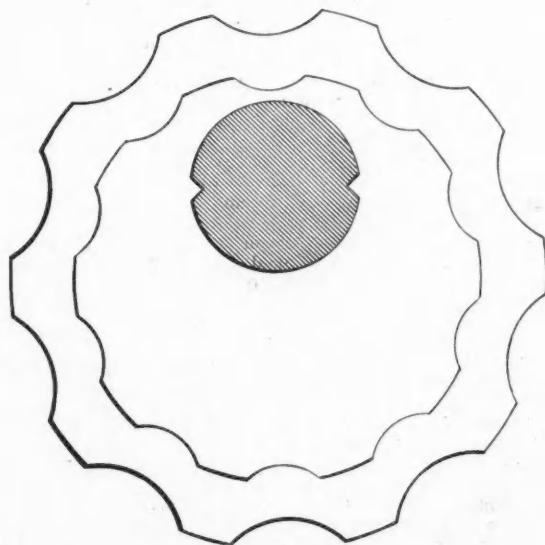


FIG. 3.

revolve they stir up the coal upon the screen and assist it to travel along, which motion is also assisted by the screen being placed at an angle.

The fine coal passes through the smaller spaces and the larger pieces are carried on by the rotary eccentric disks to the larger spaces, all of it falling into suitable receptacles or pockets. The serration of the edges of the disks gives more of a grip upon the coal, so as to enable them to move it along. It will be noticed that the sifting spaces increase in size from one end of the screen to the other.

This screen is used on run of mine where slow speed to prevent breakage is required; the eccentric motion giving the coal an even movement while passing over the screen. It can be set at such a low angle that the coal must be carried by the motion of the disks only. The corrugation in disks and washers prevent clogging or filling up with damp coal. The openings can be changed quickly if a different grade of coal is required by use of thicker or thinner washers between the disks; the same disks being used in either case.

**GOLD MINING IN FRENCH GUIANA.**

Written for the Engineering and Mining Journal by E. D. Levat.

(Concluded from page 40.)

The value of the Guiana placers is generally so fine that there is no need of exaggerating it by selecting samples for test or assay. Very much poorer alluvions are worked with profit in countries offering similar technical difficulties, but which are better provided than Guiana as to facilities of transportation and the hiring of labor. It is easy to understand that this value is intimately connected with facilities for access. From this point of view we may consider three classes of placers:

1. Placers situated in the most unfavorable localities, as in a country absolutely destitute of resources, without any neighboring workings from which assistance might be invoked, or a loan of food in case of need, thus allowing the miners to gain time. An average value of at least 10 grams per cubic meter is required before risking operations. This is what the first prospectors of Arva and Caservene have asserted.

2. Placers already opened in the normal period, but situated in the limit of a zone from 150 to 200 kilometers beyond the point where steam navigation is practicable. Five grams to the cubic meter warrants an enterprise with some assurance of profitable results on placers in those regions.

3. Placers connected with the sea by streams navigable for small

steamboats. Here alluvions or tailings may be worked with profit which yield 3 grams per cubic meter. The placers are generally found in valleys of 100 to 150 meters in depth, covered with thick forests. Of course it is indispensable, before beginning any work, to get rid of all vegetation. This is often hard and expensive work, constant rains allowing no opportunity to use fires to clear off the woods. Roots must also be removed. All these operations cause considerable expense, which may be estimated at not less than \$2,000 per hectare.

The method of washing consists in the use of a portable sluice, fed by collecting the river waters at the upper side of the claim and gradually moved up stream from the first workings at the lower end as the work progresses. The apparatus is always composed of a variable number of "boites" (boxes). These "boites" are slightly narrower at one end, in order to allow them to join together. Their length is constant, 4 meters, say, and their middle width about 0.30 meters, with side posts measuring 0.25 to 0.30 meters in height. The whole is supported by posts planted in the bed rock. The grade may be easily regulated by means of an iron hook of a special shape and attached to notches in the supports. The whole apparatus is portable and extremely simple. The length of the sluice very seldom exceeds 12 boxes, or a length of about 45 meters. This is considerably longer than the average, which is 9 boxes, or about 35 meters. The usual grade of the sluice varies between 8 and 12 per cent., according to the nature of the material passing through it. The method consists in removing the dirt with shovels only, and it is necessary to fill in the hole left by the washing of the sands with the vegetation of the new working surface. By this means an intermittent working only can be obtained, since it is necessary to stop the working of the claim during the time that elapses between the moment when the work in the sluice is over and the time when the next trench is opened, and all the laborers are employed in clearing out the preliminary excavation of the neighboring claim. The loss of time which is occasioned by this system varies, according to the statements which I have taken from the companies' books, between 23 and 42 per cent. of the total days of the season.

From 12 to 15 men are generally employed for the working of a sluice. They are classified thus: Diggers, 2 men; shovelers, 4; cleaning out the mine (bush, etc.), 1; removal of boulders, 1 woman; taking care of the riffles, 1 woman; taking care of tailing race, 2 men; supervision, 1 man; total, 12 men and 2 women.

At the beginning of the work about 2 kgs. of quicksilver are poured into the sluice, in such a way that all the gold, even the largest grains, are submitted to its action.

It is assumed that the average yield of auriferous alluvion, that is, the quantity of pay dirt actually washed in a day on every claim, divided by the total number of miners and other employees in the placer, does not exceed half a cubic foot per man per day.

An infallible way of lowering the rate of wages on placers is the establishment of a provision farm on the spot, where nourishing vegeta-

bles and other wholesome food suitable for negroes, are sold to the laborers at reasonable prices. The adoption of this plan has had a most successful effect upon the sanitary regime of the men. Workings on which trees have been torn down, and on which manioc, bananas and sugar cane have been planted, have immediately shown a considerable decrease in the percentage of sickness among the working people and employees generally. Besides, the food is greatly appreciated by the negroes and helps to keep them at the placers or induces them to return from other places where they are fed with canned goods.

As it would be impossible for the working man to assume the expense and the risks of the voyage to reach the placers without the certainty of finding assured wages for a sufficient period of time, a contract is usually signed which specifies the wages to be paid and the food to be furnished.

There are on the placers some stores where the workers may exchange provisions. On most placers a certain space of ground is at the disposal of the workman, should he desire to cultivate it. Firewood is free.

Provisions, and implements used on placers are brought to warehouses situated on the bank of the river, by means of small rowboats, or boats towed by steamboat. From these warehouses to the working claims the carriage is generally made by portage. The load for a man is 25 kilograms, and the distance varies from 8 to 11 kilometers, according to the difficulties of the road.

The work on an active claim is composed of: 1. The clearing away of timber, brush, etc., chopping down the trees and afterwards cutting to suitable lengths. 2. Stripping. The task of clearing away the piles of timber generally represents a square of 2 meters a side, and 1 meter in depth. Consequently the task of stripping represents 4 cubic meters. 3. Attack upon auriferous layers. When the stripping is finished the apparatus used for washing auriferous soil is put into position, then the layer of gravel is worked with mattock (pick-axe) until the clay is reached.

At 3 p. m. they stop work and miners may then undertake a task of clearing off to double their day's work. Women are generally employed to break up the auriferous clay by hand, or with the hoe, and to throw out the stones which obstruct the washing apparatus.

Sawyers and wood cutters are employed in equal numbers on the placers. The task for two sawyers is one big tree or two medium size. In the cutting up into parts two men must cut from 4 to 6 pieces. The task of trimming is limited to a piece 4 meters long. It must be squared on four sides. Two sawyers must daily supply 4 planks measuring 4 meters in length, 0.44 meters in width at one end and 0.36 at the other end (bottom plank for sluice). Or else five planks of 4 meters in length by 0.33 in width (side plank). The sawyers work also at the rate of 2 fr. per side plank and 2.50 fr. per bottom plank.

The mining law of the colony is very simple and very liberal. Anyone, whatever his nationality, may, by making a simple application to the Secretary of the Interior, and by paying the taxes, obtain the ownership of a piece of ground for the working of gold. The tax is 0.10 fr. per hectare for the first two years, and 0.50 fr. for the nine following years. The permit for a working may be renewed every nine years by paying always, of course, the tax of 3.50 fr. per hectare. All these taxes must be paid in advance.

A map of the surveyed lands is in existence at Cayenne, on which the concessions are classified according to the order of application. A copy of this map is joined to the title delivered to the applicant, in order that in case of discussion about the ground it may be always easy to ascertain the rights which go with the first application.

The foundation of the mining law of Guiana is the fact that the ground belongs, without exception, to the one who makes the first application. Besides the land tax the gold workings must also pay an allowance of 8 per cent. on the gold collected, estimated at the value of 2.70 fr.

Lastly there is a statistical tax of 5 fr. per kilogram of gold, to be paid when the metal reaches Cayenne. The difficulty of supervision in a country as spacious and with such a small population as Guiana has the result that only a part of the gold gathered on placers pays the export duties.

The figures which we see in the official statistics represent closely the production of well organized companies operating in the country. The greater part of the gold worked by the individual prospectors escapes the tax, and, consequently, the statistics. Under these conditions we may estimate that the official figures of gold production in Guiana hardly represent more than one-third or a fourth of the real production of this country.

#### FINE GOLD MINING AND CONCENTRATION.

Written for the Engineering and Mining Journal by N. J. Fleck.

Flour gold is usually found along the larger rivers of the West. The deposits are quite different from the ordinary placer gold. This class of gold occurs in narrow streaks near the surface of high gravel bars, which belong to the older formations. These "high bars," as a rule, are cut by the present channels of the rivers very much below the old bed. This makes an ample dump for the mines.

The gravel cut down from the high banks is sometimes concentrated on the water line or carried down into the main channel and can be mined only by dredging. In mining the high bars the ground race and flume are perpendicular to the course of the river where in gulch mining the flume is laid in the bed of the stream and parallel with its course.

The principles of concentration are often followed to a limited extent in practice in placer mining, but are thoroughly understood by few miners. A placer miner will state that gold in gravel is concentrated in a swift stream of water, and the more grade the better concentration will be. This is true: now how to attain this high degree of concentration without loss, is very imperfectly understood, as the failures of so many mines will prove.

This principle is illustrated in the river burlap machine, which does concentrate in a very practical and also theoretical way, and is, I be-

lieve, the most perfect placer concentrator known to us. When the parts of this machine are proportioned correctly, we are able to take the largest mining head (of water) carrying the heaviest gravel, give the concentration surface a steep grade and hold the "lightest gold."

The material is screened to  $\frac{1}{8}$  in. and then flows out on the tables, where the water is expanded to an enormous width. The water is then only about 1 in. deep, with a fall of from  $\frac{1}{2}$  in. to 2 in. per foot. The screening is farther carried on by the burlap on the table, which acts as minute riffles. Below the burlap is placed canvas, over which the last undercurrent flows and the final concentration takes place. This canvas also receives the gold when the burlap becomes slimed. The material is supposed to be near one size, the same as in the dry gravity concentrator, and the velocity is just sufficient to carry sand, to roll magnetic sand and deposit gold.

This machine, as we build it now, is evolved from the old California blanketed undercurrent. It is greatly improved in the essential parts, from experience in the different deposits of cement and clay gravel carrying fine gold, and by the investigations of the cause of the success or failure of different mines. The use of riffles is more or less dispensed with by a series of screens, with grizzly plates, burlap and canvas. An ordinary machine contains from 400 to 800 sq. ft. of concentrating surface.

The mill men who understand the technicalities of concentration may observe here some of the elementary principles in outline. The former method of mining fine gold was to amalgamate direct, but it seems more practical to concentrate, as better work can be done and much more rapidly. Simple as the work is compared with milling, there are quite a number of evolutions.

First the gravel is undercut by the running water in the pit, the bank caves down, is whirled through the ground race into the flume, which narrows up, and the head gains force; then at the lower end the flume is laid on a level and widens to prepare the gravel for the grizzly.

In passing over the grizzly, the grade constantly increases. Toward the lower end, where the tar and fine sand have nearly gone through, the grade is quite steep, so the large gravel will roll into the flume, where, after a steep descent, it joins the tailings from the tables and goes through the tail race to the dump.

This machine, when well adjusted, is automatic. A particle of rock or rounded gravel travels over the curved grizzly surface, rolling on its edge with a uniform speed throughout the length, causing a clear vibration, which keeps the plates clear.

In good work the burlap and canvas are taken up every few days and washed in the concentrate tank. The flour gold lies in wave-like streaks, will lodge among the fibers of the burlap and on the canvas. The tables are from 6 to 24 ft. long, and when the gold appears half way down they are cleaned up.

In cleaning up it is not necessary to stop the mining. The water is shut from one table without abating flow over the other.

A riffle exposing the same amount of concentrating surface as a burlap with the same grade and amount of water would load and the concentrates would be poor, even though screens were used to protect them. This fact has often been proven by miners along the Snake, Colorado and Columbit rivers.

The best amalgamation of the concentrates which contain slime and magnetic sand with the gold is very thorough and effective as practiced on the Snake River in the oldest mines. If the gold is bright it is amalgamated direct from the concentrate tank, but is generally treated with chemicals.

The copper-silver plate rocker is used and amalgamation differs from the mill plate inasmuch as the plate is kept in motion, so as to cause the greatest amount of friction between the plate and the particles of gold.

The setting of the plate is a very complicated process. The plate is first annealed, roughed with nitric acid, brightened with cyanide of potassium. Then a little silver nitrate is put on with the quicksilver. The silver is afterwards partially removed with nitric acid. The plate is next set with gold. The little specks of gold are not left loose, but set hard with fire; this leaves the plating very rough. Finally quicksilver is put on and the gold is smoothed slightly with a spatula.

The plate is now full of little pockets or riffles which do catch the coated gold and retain it until it is brightened with cyanide or cut with acid.

The smooth plate, with large quantities of soft silver amalgam, could never do the work. The rough plate, even though it be quite wet with quicksilver and steep, will retain rusty gold to a surprising extent.

Alloys can be used to harden the gold, but it is not so malleable. The riffles are not formed to hold the refractory gold, which is found to be best treated on the plates and is made to enter the amalgam by rubbing with cyanide.

Large quantities of loose quicksilver have been tried in riffles and in traps, only to find that refractory gold floats solidly over and the quicksilver steals away on every occasion, and thousands of dollars have been lost on amalgamators by inexperienced men who do not even know the old practices of the work which they pursue, when a small plate, well set with gold, will amalgamate all the gold from the largest machine.

Altogether this system is very complete and can be adapted to a large class of river gold deposits.

**COPPER IN NORWAY.**—The Sulitelma copper mines in Norway, which were started in 1891, raised in 1898 40,500 tons of ore, of which 32,000 tons were exported and 9,000 tons were used as flux for smelting. The ore exported yielded 45 per cent. of sulphur and 4 per cent. of copper. The production of copper by the Bessemer process was 400 tons.

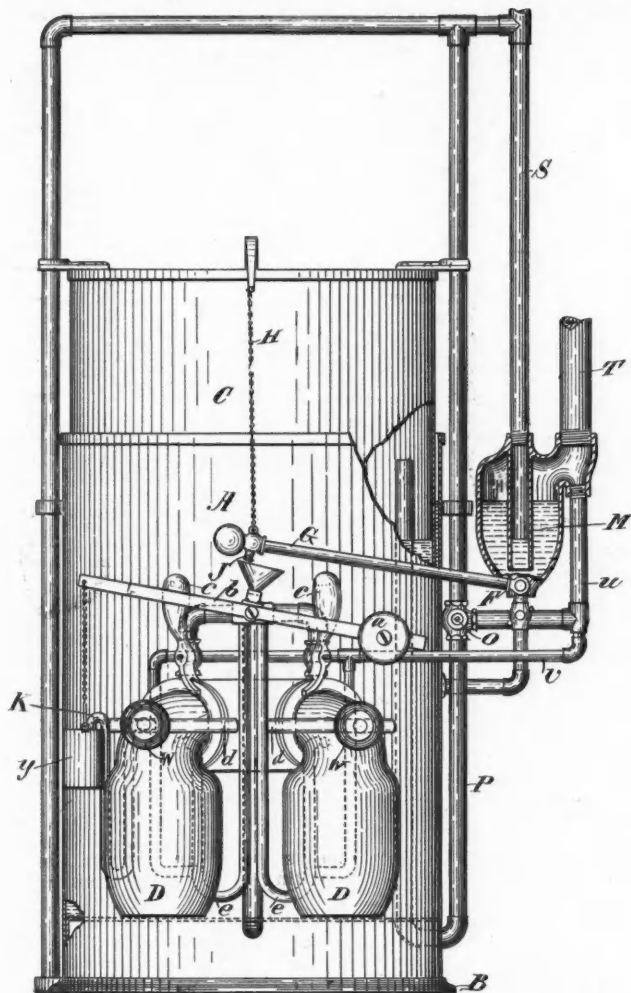
**COAL TRADE IN FRANCE.**—The "Echo des Mines," of Paris, reports that great progress is being made in the Nord and Pas-de-Calais coal field. At the Douchy Colliery the Sainte Barbe pit is being enlarged to a diameter of 5 m. continued to a depth of 800 m. and equipped for an annual output of 300,000 tons. At Dourges the out-turn of coke in 1898 amounted to 82,171 tons, as compared with 50,116 tons in 1897. Thirty new coke ovens have been built, bringing the total up to 120.



AN ACETYLENE GAS GENERATOR.

The accompanying illustration shows a generator for making acetylene gas from calcium carbide, which is now being introduced by the Auto-Acetylene Company of New York. The generator consists essentially of a suitably sized gas holder and tank, having two carbide holders, one at each side neatly and conveniently placed close to the base of the tank, from which they are easily detached and again secured in position by means of clamping screw yokes. Only one carbide holder at a time is in operation generating gas, so that ample time is allowed for refilling the other not in use, and a device is provided for automatically changing the supply of water from one to the other and for indicating, at the same time, the holder not in use. The operation of the machine is automatic, and gas is generated in only the quantities consumed. Escape of gas to the atmosphere except by the safety escape seal is impossible even should both of the carbide holders be detached at the same time.

These generators, the company claims, are made of the best materials and carefully tested before shipping. Each generator is provided with a condenser to cool and dry the gas. It has also water seals and safety gauges, so that the uniform pressure suited for the pipe system can be maintained. The moisture is drawn from the service pipe by a trap con-



ACETYLENE GAS GENERATOR.

nected with the condenser. An important point is in proportioning the reservoir to the average flow of gas, and giving it free range of movement. The machine is especially adapted for isolated plants, as at mills, mine offices and similar places.

GASOLINE HOISTS AT MINES.

The accompanying illustration shows a gasoline hoisting engine that the Fairbanks-Morse Company of Chicago has recently placed at the mines of the Golconda Mining Company, at Cripple Creek, Colo. Another of the same type has been sold to the Morning Star Mining Company at the same place, the former property taking a 22 H. P. engine and the latter one of 12 H. P. Reports from both properties speak highly of the hoists as doing good and serviceable work. The cost for operating the Golconda plant is less than the price for water for a double 6 by 8-in. steam hoisting plant. Both engines are capable of lifting a 60-gallon bucket of rock ore. The 22 H. P. engine is now working to a depth of 320 ft. and its full capacity will not be tested until at least 1,000 ft. is reached. At the mines the tool-dressing forges are located conveniently near the hoist, this enabling one attendant to operate the hoist as well as attend to the dressing of the tools. The hoister is self-contained, being in one piece, requiring but a single foundation. Cut gears are used. The small pinion of the engine shaft is supported on either side by the bearings, thus preventing any twisting or bending action of the engine shaft, a feature peculiar to Fairbanks-Morse construction.

The clutch engaging the drum with the drum shaft is of an improved construction, and does away with the objectionable end-thrust in some makes of hoisters. This clutch is operated with toggles and takes off

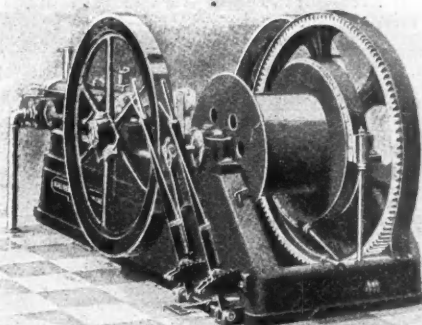
any strain from the bearings. A foot pedal controls the speed of the hoister, and the ease with which a bucket can be handled is remarked by those who are in charge of the machinery.

QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert; nor can we undertake to give advice about mining companies or mining stocks. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered.—Editor E. & M. J.)

Sulphuric Acid Chambers.—Is there any difference in the chamber space needed in the manufacture of sulphuric acid at high altitudes—such, say, as Denver Colo., or Butte, Montana?—H. E. McD.

Answer.—In answer to this question we are permitted, through the courtesy of a correspondent, to give the following opinion given on a similar question by Dr. G. Lunge, of Zurich, Switzerland, the well known authority on acid manufacture: "Owing to the great altitude of Denver above the level of the sea a certain cubic space necessarily contains a smaller weight of oxygen than at a lower level, and the chamber space should be correspondingly larger. Even at sea level a space of 11 or 12 cubic feet, as used in a few French plants, where the work is forced or driven, is altogether exceptional. The rule is to allow 20



FAIRBANKS-MORSE GASOLINE HOISTS.

to 25 cubic feet per pound of sulphur burned in 24 hours; and at Denver you should add at least 10 per cent. to this space."

Crushing Rolls.—Can you tell me what advantages are claimed for rolls in crushing fine material? What are the best makes? At how high a speed is it usual to run rolls on ordinary ores, say quartz or the like?—S. C. C.

Answer.—1. The advantages claimed for rolls are the simplicity of the machine, its high capacity for work and the uniformity of the product. The original Cornish rolls earned a reputation for their work many years ago; since then many improvements have been made in details, though the general type of the machine as first introduced has been retained. The improvements, however, have very much increased the capacity and efficiency of the machines, at the same time reducing the power required to run them.

2. There are several patterns of rolls on the market, made by reputable firms or companies. Special excellences are claimed for each, and probably each type excels in some small point, though they may differ little in general results obtained. You cannot go wrong with any of the manufacturers of established reputation.

3. The best practice gives a surface speed of about 1,000 feet a minute on the face of the roll for ordinary material. Too low a speed is not economical in the results obtained or in power expended. On the other hand, too high speed involves excessive friction, rapid wear of rolls and bearings, heating of bearings and greater danger of wreckage. Good authority gives the speed above mentioned. Of course this may have to be changed on special material—very hard or soft. There seems now to be an inclination to return to lower speeds than were advocated some time ago.

Working Flat Placers in the Tropics.—In further answer to the questions asked by E. F. H. in the "Engineering and Mining Journal," June 24th, page 735, William H. Baur, Anaconda, Montana, sends the following:

Answer.—A placer where there is no fall and clay bed-rock is not a good proposition, and the ground will have to be rich to yield a profit. Clay in placers is a robber of the gold in the sluices, as it is apt to ball up and roll along in the sluices, picking up any gold it comes in contact with. Consequently the clay, water and gold must be kept separate as far as possible.

My plan would be as follows: Construct a line of sluices from 10 to 15 ft. above the ground, supported by posts. The sluices should have a fall of not less than 4 in. in 12 ft., or more if both gold and gravel are coarse. Pump the water up in the head sluice, also elevate the gravel dry by a bucket elevator and let it slide into the sluice box, where it mixes with the water. The gold will be caught in the riffles in the sluice boxes. The gravel out of reach of the elevator could be brought there for a short distance by scrapers. After the distance becomes too great, the pump and elevators will have to be moved. The gold-bearing gravel is to be taken off the clay bed-rock with as little clay admixture as possible and dry, the first water to touch it being in the head sluice. If horses or mules are cheap and labor only indifferent and cheap, the gravel might be brought up to height of the sluices by wheel scrapers if a trestle is made to drive up to the sluice and down again on the other side. In this case a steam pump and boiler would be the only machinery required. The gold quartz float could be gathered by hand from the tailings pile, and the sluices handled as in ordinary placer mining.

The Siberian Railroad.—What is the present eastern terminal of the Siberian Railway? Has any construction been started from the Pacific Coast? If so, how far has it advanced? What is the present estimate by the Russian Government as to the date of completion of an all-rail route to the Pacific Ocean? Is the present eastern terminal at the end of an all-rail route, or does part of the trip have to be made on river steamers? Is construction being pushed at the present time? As matters now stand, what distance would have to be gone over on horseback or other animal transportation after leaving the terminal of the railroad in order to reach the Pacific Ocean? The foregoing is quite an imposing lot of questions, and I trust that I am not imposing on you in asking for the information. I have tried to get it in every direction and so far have failed most signally.—L. N.

Answer.—The completed part of the Siberian Railroad now consists of three sections. The Western Siberian line is in full operation and runs regular trains from Chelabinsk—the terminus of the Oural Line, which is the connection with the railroad system of European Russia—to Tomsk and Achinsk, a distance of 1,267 miles. On the Central Siberian Line, from Achinsk to Irkutsk, 1,038 miles, regular trains are running for about two-thirds of the distance, and the construction trains are expected to reach Irkutsk this season. The third completed section is on the Pacific end, where trains are running from the port of Vladivostok to Khabarovka, 261 miles. The unfinished sections are the Baikal Loop, from Irkutsk to Missovskaia, 194 miles, and the Trans-Baikal line, from Missovskaia to Sretensk, 663 miles. No trains are running on these sections, but a considerable part of the grading has been done.

According to the original location, the road was to be completed by building about 1,000 miles through the Amoor Valley from Sretensk to Grafkskaia on the Oussouri line. This section has been abandoned, however, and for it has been substituted what is known as the Eastern Chinese Railroad, which is to extend from Sretensk through Manchuria and other provinces of China to Port Arthur, which is now a Russian port, and has been chosen as the commercial terminus of the line because it is further south than Vladivostok, and the port is not closed in winter. The Russian Government has a very large force at work on this section, and some track has been laid, but no regular trains are running yet. We may mention here that this Eastern Chinese road will be laid with American rails and operated by American locomotives. The completed Oussouri section will, therefore, be operated as a local line, and to connect Vladivostok with the Amoor settlements; it will not be a part of the main line.

The date set for the completion of the road was originally 1905; but it seems quite possible that this will be anticipated, and that trains may be run through by the end of 1903.

As to traveling over the line, it would probably be very difficult at present to start from Port Arthur; it could hardly be done at all without special permission and a Government escort. From Vladivostok you could take the railroad to Grafkskaia, and from that place to Sretensk, about 1,000 miles, you could travel by steamboat on the Amoor—in the summer. The distance of about 700 miles from Sretensk, which is the head of river navigation, to the eastern shore of Lake Baikal would have to be covered on horseback, or more probably in the post-carts which travelers use in Siberia. Steamers run on Lake Baikal and the Angara River, leaving only about 50 miles of land travel to reach Irkutsk. From that city you could take the railroad, as we have already mentioned.

If you want to make the journey—as we presume you do—for purposes of scientific exploration, you would find it to your advantage to apply to the Ministry of Roads and Communications, which could be done through the American Ambassador at St. Petersburg. The Russian Government is anxious to bring the resources of Siberia and the work on the great railroad to the notice of the world; moreover, Prince Hilkoﬀ, the head of the Ministry mentioned, has been in the United States and is understood to be very favorably disposed toward Americans.

## PATENTS RELATING TO MINING AND METALLURGY.

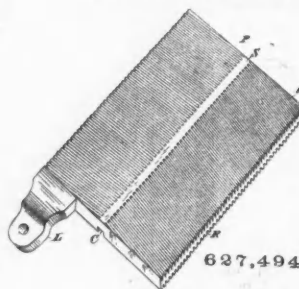
## UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

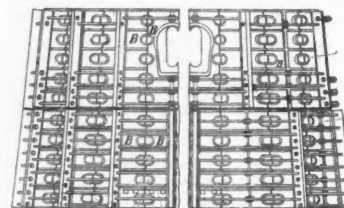
Week Ending June 27th, 1899.

- 627,494. STORAGE BATTERY. Warren P. Freeman, New York, N. Y. Assignor, by direct and mesne assignments, to the Empire Electrical Machinery Company, of New Jersey. A plurality of storage-battery plates provided with offset lugs L coupled together and holding apart the adjacent plates a distance somewhat greater than their thickness, in combination with one or more similar plates provided with similar lugs and interposed between the first said plates, each of the said plates being provided with V-shaped grooves of depth less than one-half the thickness of the plate and inclining downward toward the center of the plate, and with a vertical channel C on one side of the plate and a solid rib S on the other side opposite to the said channel C.

- 627,545. BLAST FURNACE. Maximilian M. Suppes, Elyria, Ohio. A hearth-jacket for blast-furnaces comprising the combination of a plurality of sections contacting to form a circular jacket, couplings between



627,494



627,545

the ends of each pair of contacting sections, vertical columns bearing against central portions of alternately-located jackets, bearing-blocks at the central portions of the intermediate jackets, and stay-bolts connecting the said columns and bearing at their centers against the bearing-blocks.

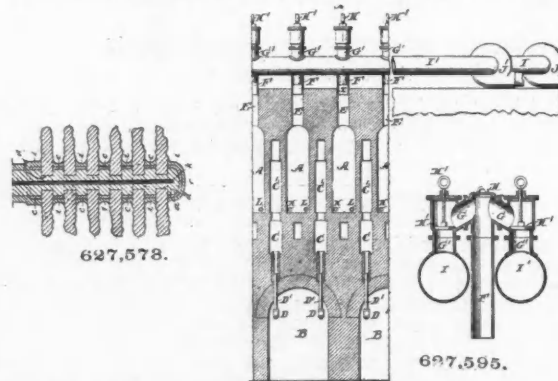
- 627,546. MACHINE FOR SHAPING METAL BY ROLLS. John Tedell, Moline, Ill. Assignor to the Deere & Company, of Illinois. The combination of shaping-rolls with faces contacting under pressure, one of said rolls having a movable section and a die-recess in its face, mechanism for oscillating the sectional roll, and automatic means operated by said mechanism for clamping the blank between the sections under one direction of movement and releasing the same under the reverse direction.

- 627,573. ELECTRODE. Charles C. Connor, Belfast, Ireland. An electrode comprising a number of pieces of carbon, each having a perforation, arranged one above another with a distance ring between each piece, and connected together by a longitudinal core of cast-lead or other like metal or alloy, the core being furnished with a protective covering of cement or other suitable medium.

- 627,575. SEPARATOR. Henry L. Day, Minneapolis, Minn. A separator consisting of a spiral or convolute duct or passage having a continuous-surfaced spiral wall or partition, provided with a peripheral discharge for the separated solid particles, with a peripheral opening at its outer end for the escape of the purified gaseous current, an inlet-conductor connecting with the inner or central end of said duct or passage, and a fan located in said duct or passage at the inner end.

- 627,579. PULVERIZING-MACHINE. Gideon Frisbee, Philadelphia, Pa. In combination, a pulverizing-chamber, a stationary ring-die and revolvable rolls therein, and a discharge apparatus comprising one or more cup-shaped screens located adjacent to one end of the pulverizing-chamber and mounted upon an independently-revolvable frame, the lower edge of said screen or screens being substantially above the lower inner edge of the said ring-die.

- 627,595. COKE-OVEN AND METHOD OF OPERATING SAME. Frederic W. C. Schniewind, Pittsburg, Pa. Assignor to the United Coke and Gas Company, Charleston, W. Va., and Philadelphia, Pa. The method consists in inclosing successive charges, one at a time, in



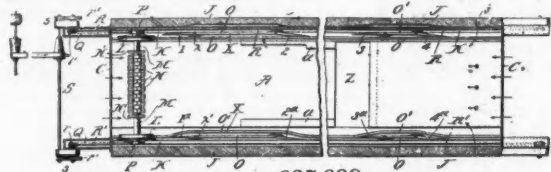
627,573.

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a closed oven, subjecting each successive charge to a coking heat applied from without purely by conduction through the walls of the oven and to all parts of the charge and distilling off thereby the volatile hydrocarbon gases, fractionally separating said gases by drawing off and collecting those generated at different stages of the coking of the charge into separate receptacles and thereby preventing the adulteration of the richer by the poorer gases and finally drawing the coked charge from the oven preparatory to recharging the same.

- 629,609. ROASTING KILN. John Zellweger, St. Louis, Mo. The combination with a hearth, of tracks arranged on each side, wheels on said tracks, a shaft supported by said wheels and fixed to at least one of them, stirrer-blades arranged on and at an angle to the shaft, the reach of said blades being unequal to the radius of the tread of the wheels, sheaves arranged at each end of the hearth, an end-

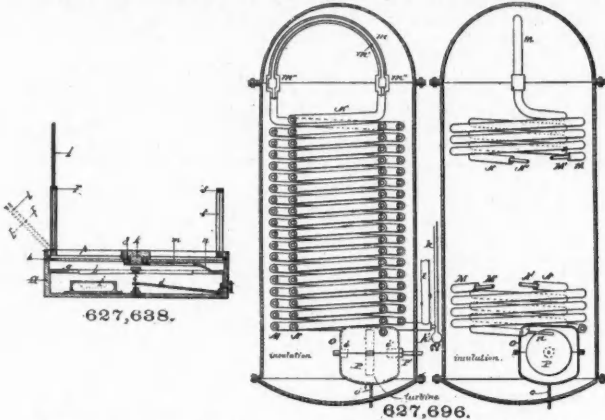




627,609.

less tow-chain on said sheaves, and a traction-line connected to the shaft, and to said tow-chain.

627,638. **FOLDING MINE TRANSIT.** Jules A. Birfield, Denver, Colo. The combination of the needle-compass, the bubble-glass, the parallel cross-bars, the axis depending centrally from said cross-bars, the vernier arranged on said axle below, said cross-bars having a deflected graduated portion, and the hinged or folding sights arranged



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between said parallel bars, at their ends, one of said sights having a sliding mirror, adapted to be projected beyond the normally upper end of said sight.

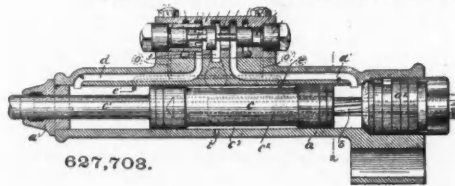
627,650. **APPARATUS EMPLOYED IN WIRELESS TELEGRAPHY.** Guglielmo Marconi, London, England. Assignor to the Wireless Telegraph and Signal Company, Limited, same place. In a receiver for electrical oscillations, the combination of an imperfect electrical contact, a local circuit through it, an induction-coil, a capacity, a conductor connected to one end of the primary of the coil, a connection between the other end and the capacity, connections between the ends of the imperfect contact and the ends of the secondary of the coil and a condenser in one of the latter connections.

627,660. **DREDGING APPARATUS.** Andrew K. Stone, Boston, Mass. Assignor to the Pan-American Dredging Company, same place. A boom; a main and an auxiliary chain or cable; a block carried at the end of said auxiliary chain or cable; a bucket having an attached block over and about which the said main chain or cable is passed, said chain or cable, being attached to the block carried by said auxiliary chain or cable; means to wind said main chain or cable at a slow speed and to thereafter wind both said chains or cables at a faster speed, and a bucket-beam, and a bucket.

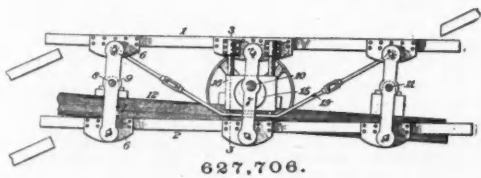
627,662. **STEAM DREDGE OR SHOVEL.** George E. Turner, Marion, O. The combination in a dredge, of a shaft, a drum, a brake-band encompassing said drum, a steam-cylinder having its piston-rod operatively connected to said brake-band, and means for simultaneously operating said piston-rod and connecting or disconnecting said drum and the power-shaft.

627,696. **APPARATUS FOR LIQUEFYING GASES.** Joseph E. Johnson, Jr., Longdale, Va. In combination, a compressor, a cooler, an insulating vessel, a counter-current apparatus in said vessel, a separate liquid-air receiver in said vessel with which the counter-current apparatus is connected, and a means in said receiver for causing the compressed air to do mechanical work against resistance when released.

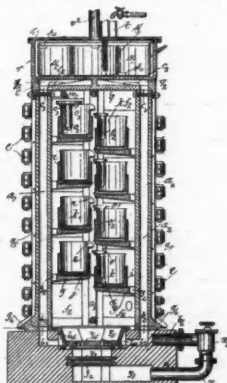
627,703. **VALVE FOR ROCK-DRILLS.** Thomas Officer, Claremont, N. H. Assignor to the Sullivan Machinery Company, of New Hampshire. The combination of a cylinder having inlet and exhaust ports, a piston, a piston-valve controlling said ports, said valve having pistons at each end thereof and a single one intermediate thereof, said intermediate piston being of greater area than either of the



627,703.



627,706.



627,749.

end ones, and said cylinder having reversing-ports in the upper and lower portions thereof leading to the lower and upper ends respectively of said piston-valve, whereby said piston-valve is unbalanced when the piston passes the reversing-ports.

627,706. **SCREENING APPARATUS.** David E. Phillips, Mahanoy City, Pa. The combination with upper and lower screens, and supporting-links fulcrumed between and pivotally connected with said screens, of a driving-shaft provided with a cam, a guide-block operated by said cam, and having a guideway, and a standard secured to one of said screens, and extending into said guideway.

627,721. **FURNACE FOR HEATING INGOTS OR BILLETS.** Victor E. Edwards, Worcester, Mass. The combination, in a furnace, of a pair of water-pipes, extending from the charging end of the furnace to a point near the delivery-opening of the furnace, said pipes being curved downwardly through the body of the furnace with the ends

of said pipes connected with a water-supply, and a floor of basic material at the curved ends of said water-pipes, having its upper surface coincident with the plane of said pipes.

627,737. **RETORT FOR MAKING WOOD-GAS.** George W. McLeod, Tacoma, Wash. Assignor to the Northern Light Wood Gas Machine Company, Pierce County, Wash. A retort provided with a series of external chambers communicating with each other at alternate ends and one of said chambers communicating with the retort, a tube or shell fitting in one of the external chambers and provided with screens for devaporizing substances extracted from the gas-producing material, an oven inclosing said retort and its external chambers, and means for leading off the gas to a purifier.

627,749. **APPARATUS FOR CONCENTRATING ACIDS.** Oscar Guttmann, London, England. An apparatus comprising a closed upright structure having doors each provided with an inwardly projecting shelf or tray arranged to form within said structure spirally-disposed steps, means at the foot of said structure for heating it internally and means at the head thereof for educting the vapors and products of combustion.

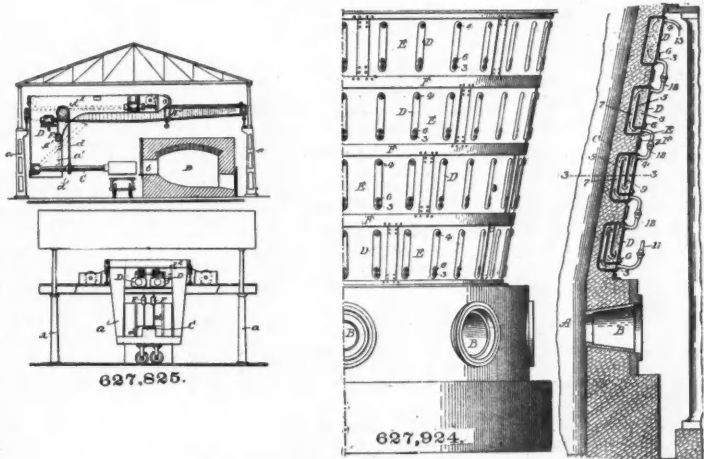
627,825. **FURNACE-CHARGING APPARATUS.** Gustave Lentz, Dusseldorf, Germany. The combination with a peel pivoted at one end, of means for swinging the peel upon said pivot, and means adapted to rotate the peel upon its axis.

627,835. **APPARATUS FOR CASTING AND HEATING INGOTS.** Samuel T. Wellman and Charles H. Wellman, Cleveland, Ohio. Assignors to the Wellman-Seaver Engineering Company, same place. The combination of apparatus for producing molten metal, a car-track adjacent to said apparatus, a car adapted to run upon said track, means for casting ingots upon said car, a heating-furnace embracing a portion of said track, said portion being depressed below the level of the track located without said furnace, water covering said depressed portion, said car adapted to travel through said heating-furnace.

627,855. **PROCESS OF REFINING IRON.** George F. Key, Ann Arbor, Mich. The process consists in intimately mixing the molten metal with finely-divided limestone or other basic material, atomizing this mixture in a highly oxidizing atmosphere of air and steam, collecting the atomized mixture into a bath and then blowing the same with air, or other refining purifying-gas.

627,884. **MANUFACTURE OF CEMENT.** Jacob Steiger, London, England. Process for the manufacture of a silicated magnesia cement in dry form, by mixing solutions of chloride of magnesium and silicate of potash, or soda, reducing the mass, thus mixed, to a dry powder by heating and adding calcined magnesia.

627,924. **BOSH-PLATE.** Charles J. Gustafson, Sequachee, and Ambrose P. Gaines, South Pittsburg, Tenn. The combination with a furnace having a recess in its wall with its longest dimension vertical and



terminating at or near the inner wall of the furnace, of a vertically-elongated closed box or chamber seated in said recess and having inlets near the bottom and near the top; an inlet-pipe connected to opening, means for forcing water under pressure through said inlet-pipe, and a baffle-plate extending from the front wall of the box toward the rear wall of the same and then upwardly, whereby a contracted passage is formed between the vertical portion of the plate and the rear wall of the box.

GREAT BRITAIN.

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

Week Ending May 27th, 1899.

- 13,202 of 1898. **LEAD OXIDE REDUCTION.** G. Bischoff, London. Apparatus for reducing litharge and other lead oxides to suboxide.
- 13,556 of 1898. **STAMP MILL GUIDE.** F. Freeman and E. S. Brett, Coventry. In stamp mills a water-lubricated guide to prevent grit passing from the mortar box to the rain guide, and devices for rotating the stamps.
- 14,089 of 1898. **ORE SEPARATION.** G. Fischer, London. System of separating ores reduced in stamp mills, in order to simplify the treatment of shales.
- 16,519 of 1898. **COAL BREAKER.** C. L. Ange and E. L. Blum, Rouen, France. Automatic breaker and classifier for coal, etc.
- 4,712 of 1899. **AMALGAMATING ALKALINE METALS.** A. N. Blomquist, Stockholm, Sweden. Producing finely divided amalgams by grinding mercury with magnesium, aluminum or metals of the alkaline earths.

Week Ending June 3d, 1899.

- 11,011 of 1898. **SULPHIDE ORE TREATMENT.** J. A. Edwards, London. Shells, skimmers and vats for use in the process of treatment of sulphide ores with chloride of sulphur.
- 14,137 of 1898. **ZINC-LEAD-SULPHIDE PROCESS.** S. Cowper-Coles, London. Modifications in the inventor's zinc-lead sulphide process, whereby white lead is formed.
- 21,093 of 1898. **STAMP MILL GUIDE.** J. T. Richards, Mysore, India. For stamp mills improved guide blocks of hard wood, formed in two parts and boxed in direction of grain.
- 24,307 of 1898. **ZINC PRODUCTION BY ELECTROLYSIS.** W. Strzoda, Katowitz, Silesia, Germany. Electrolysing zinc ores in alkaline bath, thus precipitating zinc in one operation.
- 6,060 of 1899. **SMELTING SYSTEM.** W. Borchers, Aix la Chapelle, Germany. Regenerative system of alternate smelting, with the object of obtaining high temperatures.

## PERSONAL.

Mr. R. C. Chambers returned to Utah from San Francisco on July 8th.

Mr. J. R. Case, of Chicago, is spending several weeks in Utah looking after his mining interests.

Mr. L. C. DuBois, recently at North Chatham, N. Y., has gone to Turret, Colo., on mining business.

Mr. Anson Phelps Stokes, after spending several weeks in Utah and Nevada, returned East a few days ago.

Mr. Samuel Newhouse sails from New York July 15th on the steamer "Campania." He is to remain abroad 2 months or more.

Mr. L. A. Dunham left Salt Lake City for San Francisco on July 8th. He is investigating the worth of 2 California mining propositions.

Mr. J. A. Coram, after spending several days in Utah, went to Butte on July 8th and from there will probably continue East to Boston.

Mr. Max A. Plumb, of the department of chemistry in the University of Oregon, will spend the summer in the Bohemia Mining District in Lane County, Ore.

Major J. E. Jackson, on July 4th left Salt Lake City for the City of Mexico, where he assumes the duties of manager of the Mexican Ore Purchasing Company.

Mr. Geo. A. Packard, of Boston, is examining mining properties near Silverton, Colo., to report on the feasibility of treating some of the ores by the cyanide process.

Mr. William Van Slooten, mining engineer, of New York City, passed through Denver a few days ago on his way home from examinations of mining property in Mexico.

Mr. W. W. Oliver left Denver last week to take charge of the Dwight Furness Company's mill, built by the Edward P. Allis Company of Milwaukee, at Guanajuato, Mex.

Messrs. Albert Kidder of Marquette, Mich., W. H. Gotterwell of Milwaukee, Wis., and Leslie Maitland have been on the Mesabi and Vermilion Iron Ranges in Minnesota.

Captain J. R. De La Mar arrived in New York from Europe on July 1st. Instead of being in Utah on the 10th, as was planned, he was called to California on an important mining deal.

Mr. Charles Ziegenfuss, superintendent of the Juragua Iron Company, has returned to Santiago, Cuba, where his brother, Dr. W. Ziegenfuss, of South Bethlehem, will be associated with him.

Mr. Arthur C. Luck, general manager of the Nevada Company and Austin Mining Company, was in San Francisco this week. He gives a hopeful account of improved mining conditions in Nevada.

Mr. P. J. Donohue, for the past year and more manager of La Purissima Mine, San Jose de Gracia, Sinaloa, Mexico, arrived in Salt Lake City a week ago. He speaks well of mining conditions in that part of Mexico.

Mr. C. S. Newhall, until recently connected with the Anglo-Mexican, at San Jose de Gracia, Sinaloa, Mexico, is visiting the prominent Utah districts. He will return to Boston in a few days, after an absence of 3 years.

Mr. A. C. Kyle, who has long filled the position of acting superintendent of the Sierra Nevada and Union Consolidated Mines at Virginia City, Nev., has been appointed superintendent to succeed the late Roger Prendergast.

Mr. Arthur Thomas, of the British Gold Mines Company, is now in California, whence he goes to Newfoundland and thence to England. He is examining mines for some English companies and will probably return to Mexico this autumn.

Mr. Thomas Neilson, who has been acting as superintendent of the calcining department of the Mountain Copper Company at Keswick, Cal., has resigned to accept a position with the Neilson Mining and Smelting Company at Red Rock, Ariz.

Mr. W. H. Storrs, of Scranton, Pa., is now general manager of the New York & Scranton Coal Company, the Blue Ridge Coal Company and the Elk Mill Coal and Iron Company. John R. Bryden, who has been acting as temporary manager, will be retained as superintendent of the Scranton and Johnson coal companies. Mr. Storrs had charge of the coal department of the Delaware, Lackawanna & Western Railroad.

## OBITUARY.

J. G. Kelly, a mining engineer and writer on mineralogy, died suddenly at Denver, Colo., July 3d, aged 61 years.

George B. Eckert died at Reading, Pa., on July 5th, aged 65 years. He was a son of the late

Isaac Eckert, who owned the Henry Clay furnaces. After the death of his brother, Henry S., George B. Eckert had entire control of the Henry Clay properties. The furnaces were recently sold by Mr. Eckert to the Empire Steel and Iron Company.

Joseph Stokes, superintendent of the New Jersey Steel and Iron Works, died at Trenton, N. J., on July 2d. Mr. Stokes was born in England in 1833, and came to this country when but 10 years old. He was first a roller at the Trenton Iron Company's mills, but was soon made assistant superintendent, and 5 years later became superintendent of the New Jersey Steel and Iron Company.

Thomas W. Edwardes, a pioneer of the Lake Superior copper regions, died at Houghton, Mich., on July 6th. He was born in Devonshire, Eng., in 1838, came to this country in 1849 with his parents, who located at Eagle River, then in Houghton County, in 1850. Mr. Edwardes was a resident of Houghton since 1853. He at one time had considerable interests in timber lands. He once held the position of president of the Wolverine Mine, and was a director of the Florida and Edwardes mines, besides being interested in several mines in the Black Hills, Dakota.

Roger Prendergast, an official of several Comstock mining companies, died in San Francisco on July 3d, aged 63 years. He was a native of Ireland, but came to the United States when a boy. In the early 60's he went to the Pacific Coast and mined on the Klamath River in Siskiyou County and also at Copperopolis. He was foreman of the Crown Point and Belcher at Virginia City up to 1874, when he visited Utah and mined at Little Cottonwood. Returning to the Comstock he became foreman of the Consolidated Imperial and Exchequer, and was afterward supervising foreman of the Chollar, Potosi, Savage and Hale & Norcross mines. He afterward became superintendent of the Sierra Nevada mine. Mr. Prendergast was noted for his courage and self-sacrifice. The direct cause of his illness was from inhaling gas during an explosion in the Chollar Mine while saving several lives.

Henry Lefevre, who was largely interested in the mining industry of Colombia, died suddenly in Panama on July 7th, aged 58 years. He was born on the Isle of Jersey, but while a boy emigrated to America. During the Civil War he served in the Paymaster's Department of the Union Navy, and afterwards he went to Central and South America in the interest of a New York syndicate. He settled in Panama and for many years acted as the general agent at that place of the Pacific Mail Steamship Company. A widow and 7 children survive him. His oldest son, Edwin, was for some years connected with the editorial staff of the "Engineering and Mining Journal," and is now a writer for other publications. The second son, Henry, is a mining engineer, and Ernesto, the third son, controls the telephone concession in Panama, and is general manager of the Colon Electric Illuminating Company.

## SOCIETIES AND TECHNICAL SCHOOLS.

University of Wisconsin.—The University has issued a pamphlet describing the courses of study in electrical engineering, particularly designed for graduates, that will be given by the College of Mechanics and Engineering during the year 1899-1900. The courses include "Electro Magnetism and the Construction of Dynamos," "Alternating Currents and Alternating Current Machinery," "Applied Electrochemistry and Electrometallurgy" and "Electrical Installations."

## INDUSTRIAL NOTES.

The Franklin Iron Company, of Franklin Furnace, N. J., expect to blow in the furnace there about July 15th.

A movement is under way to unite some 15 or more Eastern granite quarries in one concern, with about \$12,000,000 capital.

The Rand Drill Company, of New York City, is to ship some air compressors, steel for drills and rubber hose to Clarkson & Company, of Vladivostok, Eastern Siberia.

The firm of E. Borda & Son of Philadelphia, having been dissolved, the coal shipping business carried on by the firm will be continued by the firm of E. Borda's Son & Company.

The Cleveland Rolling Mills of the American Steel and Wire Company are to erect a new blast furnace at Cleveland, O., with a capacity of 500 tons daily.

Rogers, Brown & Company, pig iron dealers, of New York, have announced that their arrangements as selling agents for the Tennessee Coal, Iron and Railroad Company will terminate August 15th.

The Truax Manufacturing Company, of Denver, Colo., reports that its business continues to

increase. It recently shipped a lot of special ore cars to Honolulu on an order from Fraser & Chalmers, of Chicago.

The Bethlehem Steel Company of Bethlehem has advanced the wages of the employees of the blast furnaces 10 per cent., and puddlers 25c. per ton, establishing the puddlers' wages at \$3.75. This advance affects nearly 700 men.

H. K. Porter & Company, of Pittsburg, Pa., recently received an order for a light locomotive from the French Rand Gold Mining, Limited, of Johannesburg, South Africa, and is to build an 8-ton locomotive for a company in Japan.

The Thomas Iron Company's Hellertown furnace has gone in blast, giving employment to 150 hands, after a long suspension. The company's iron ore mines, near Hellertown, are being put in readiness for mining after 12 years' idleness.

The Carnegie Steel Company, Limited, of Pittsburg, Pa., has begun the foundations for its new car axle plant at West Homestead. A tract of land covering 8 acres has been excavated to a depth of 7 ft. The dirt was used to fill a large depression west of the plant.

The Williams Crusher and Pulverizer Company of St. Louis, Mo., has put 10 of its patent pulverizers in the plant of the Lawrence Cement Company at Siegfried, Pa., and recently shipped 3 of the same machines to Canada. It now has an order for 3 pulverizers for shipment to Germany.

The Lukens Iron and Steel Company of Coatesville, Pa., will put its puddling mill in shape to start it in the Fall. The company has given contracts for an extension of 130 ft. to its new steel plant, and for the erection of 2 more new furnaces. Notice of increased wages has been posted at the works.

It is stated that the asphalt companies which have been competing and cutting prices have come together in the Asphalt Company of America, with a capital of \$30,000,000. It is said that the Barber Company was the promoter, and the Bermuda, California and other leading producers are in the pool.

Contracts were closed at the Denver office of the Edward P. Allis Company of Milwaukee, last week, for a 100 ton concentrating mill for the Colorado Milling and Concentrating Company, Rico, Colorado; and for a 50 ton cyanide mill for the Nevada & Utah Exploration Mining Company, Norris, Mont. The E. P. Allis Company has secured the contract for furnishing the 8 engines of 8,000 H. P. each, to be capable of developing a total of 100,000 H. P., to run the dynamos in the power house to be built by the Manhattan Elevated Railroad Company, of New York City. The value of the contract is said to be near \$1,000,000. Seven builders of engines competed for the contract.

Among the articles that Charles H. Besley & Company, of Chicago, are putting on the market is a preparation called "mannoctine," composed of greases and volatile oils which, the company claims, is a great rust preventative for machines, engines, tools, etc. It is said to withstand salt air or water, weather, and acid or ammonia fumes.

The shops of the Pottstown (Pa.) Bridge Works have started work after years of idleness. The force will be increased until the different departments are filled up with at least 1,000 hands. Work has begun on an order for 10,000 tons of structural iron for the New York Shipbuilding Company, whose plant is about to be built at Camden, N. J.

The Jeanesville Iron Works of Jeanesville, Pa., through its Denver branch, S. Middlebrook, manager, last week received an order from the Indicator Gold Mining Company of Independence, Colo., for a compound condensing mine pump for an 800 ft. lift. The company is also building a compound condensing pump with a capacity of 1,000 gals. per minute for the Desloge Consolidated Lead Company of St. Louis, Mo.

The Pierce-Crouch Engine Company, of New Brighton, Pa., manufacturer of gas engines, is running its plant full time, with a large number of orders on hand. Among recent sales of gas engines were one 50 H. P. for Warwood Tool Company, Wheeling, W. Va.; two 20 and one 13 H. P. engine for the Pittsburg & Lake Erie Railroad Company, for pumping plants at McKee's Rocks and Park Station; also one 25 H. P. engine for the Wheeling Mould and Foundry Company.

The Pressed Steel Car Company, of Pittsburg, Pa., states that in the last week in June it delivered 205 50-ton steel hopper cars to the Pittsburg & Lake Erie Railroad Company, and 17 on an order for 1,000 to the Lake Shore & Michigan Southern Railway Company. In addition, 100 carloads of trucks, bolsters, center plates, etc., were shipped to various railroad companies. Exclusive of steel cars, the total weight



of manufactured material delivered June 24th to June 30th, inclusive, was 4,397,405 lbs.

The Empire Iron & Steel Company, of New York, has leased the plant of the old Oxford Iron and Nail Company, Oxford, N. J., from the Delaware, Lackawanna & Western Railroad. The two iron mines connected with the property will be worked and part of the output shipped to the Crane furnaces of the company at Catsasauqua, Pa. The furnace is to be repaired and 2 new hot blast stoves built. The property includes 28 puddling furnaces, three trains of rolls, a nail factory and 2,500 acres of land.

The Thew Automatic Shovel Company proposes to erect at Lorain, O., a structural steel building, 75 by 200 ft., with boiler house and forge shop, 84 by 24 ft., both buildings to have slate roofs and brick side walls. The power equipment will comprise a 25-ton electric traveling crane and 75 k.w. generator, 125 to 150 H. P. automatic cut off engine and return tubular boiler. The machine shop will contain a 10-ft. extension boring mill and horizontal boring mill, lathes, planers, shaper, drill, pressers and milling machine. The plant is to manufacture the Thew automatic steam shovel and other specialties.

The Susquehanna Iron & Steel Company now owns 3 rolling mills in Columbia, Pa. The price paid for the Columbia Rolling Mill is stated to have been \$380,000, for the Columbia Iron Company works \$170,000 and for the Susquehanna Iron Company works \$165,000. The property purchased includes the mills, furnaces, office buildings and a number of dwellings. The Susquehanna Iron & Steel Company has also acquired the Aurora furnace at Wrightsville and the York Rollig Mill. Charles A. Porter, of Philadelphia, is president of the company; W. Y. Filbert, secretary and treasurer, and John J. Denny, of Columbia, general manager.

The Brown Hoisting and Conveying Machine Company, of Cleveland, O., recently secured a contract from Vickers' Sons & Maxim, of England, for 4 balanced cantilever cranes. Two of the cranes will be mounted on the Brown steel truss, while the remaining 2 will be placed on the ground. Of the company's contracts in this country, one of the most important is for a crane for work on 2 battleships building at the Cramps' yard in Philadelphia, and for 2 other similar cranes that will soon be in operation at the same yard. The battleship crane has a clear travel of 725 ft. up and down the trestle and a lifting capacity of 15 tons at 60 ft. or 5 tons at 95 ft. on either arm.

Among recent orders received by the Nordberg Manufacturing Company, of Milwaukee, Wis., for compressors are 2 pairs of compressors for the Carnegie Natural Gas Company, each of nearly 1,400 H.P., a 500 H.P. air compressor for Bunker Hill & Sullivan Mining Company, a 300 H. P. compressor for the Isle Royal Copper Company, and a 100 H. P. electrically driven compressor for De La Mar's Mercur Mine in Utah. The company has also received orders for 5 hoisting engines, with cylinders 32 in. by 72 in., for the Osceola and Arcadian copper mines, near Houghton, Mich.; also for several special engines for the same mines. It recently started a hoisting engine at the No. 5 shaft of the Tamarack mine of new design and probably the largest of its type in the world.

The H. W. Caldwell & Son Company, manufacturer of elevating and conveying machinery, of Chicago, Ill., is to have a large plant at Seventeenth street and Western avenue, where it has purchased about 2½ acres of land. The cost of the plant is estimated at \$150,000, and it is to be ready for occupancy by January 1st. There will be a machine shop 100 by 180 ft., a similar building for the sheet metal department, a central power station 56 by 73 ft., and later a perforating and wood working and other buildings, occupying all the available space. The company have been in the business for 25 years and located in Chicago for 20 years. The plant is well situated, so far as shipping facilities are concerned, the Belt Line and the Chicago & Northwestern and the Panhandle tracks lying immediately west, with switch tracks penetrating the yards.

The National Glass Company, capitalized at \$20,000,000, has been formally organized at Pittsburgh, Pa. A board of officers to be elected are: H. C. Fry, president; D. C. Jenkins, Marion, Ind., first vice-president; J. M. Jamison, Greensburg, Pa., second vice-president; Daniel C. Ripley, treasurer. The glass companies which have signified their intention of entering the combine are stated to be: Rochester (Pa.) Tumbler Company, United States Glass Company, Pittsburgh, Pa.; Indiana Tumbler & Goblet Company, Greentown, Ind.; Tarentum (Pa.) Glass Company; Canton Glass Company, Marion, Ind.; Model Flint Glass Company, Albany, Ind.; Riverside Glass Works, Wellsburg, W. Va.; Fairmont (W. Va.) Glass Company; Central Glass Company, Summitville, Ind.; Seneca Glass Company, Morgantown, W. Va.; Royal Glass Company, Marietta, O.; Greensburg (Pa.) Glass

Company; Beatty-Brady Glass Company, Dunkirk, Ind., and McKee & Bros., Jeanette, Pa. The following firms, it is reported, have refused to enter the new syndicate: A. H. Halsey & Company, Newark, O.; Cumberland (Md.) Glass Company; Bryce, Higbee & Company, Homestead, Pa.; Bryce Bros., Pittsburg; George Duncan's Sons Company, Washington, Pa.; Dalzell, Gilmore & Leighton, Findlay, O.; Co-operative Flint Glass Company, Beaver Falls, Pa.

The consolidation of the National Tube Company, with a capitalization of \$80,000,000, equally divided as to common and preferred stock, is completed. These directors were elected: Joshua Rhodes, J. J. Vandergrift, Charles H. Coster, William B. Rhodes, F. J. Hearne, J. N. Vance, John Eaton, Francis L. Potts, F. R. Tobey, Jonathan Rowland, Daniel O'Day, A. S. Matheson, O. C. Barber, Henry Aird, John Don, Edmund C. Converse, Horace Crosby, William Nelson Cromwell, William S. Eaton, A. F. Luke, William J. Curtis, William P. Hamilton and A. H. Gillard. The board elected as officers: President, Edmund C. Converse; chairman of the board, Joshua Rhodes; first vice-president in charge of manufacturing, F. J. Hearne; second vice-president in charge of mercantile affairs, Horace Crosby; third vice-president, financial, Francis L. Potts; general manager manufacturing department, A. S. Matheson; treasurer, Arthur F. Luke; assistant treasurer (at Pittsburg), William H. Latschaw. The company consolidates 21 concerns. The scheme was underwritten by J. Pierpont Morgan & Company. The output of the consolidated works is stated to be about 1,100,000 tons of all classes of tubular manufactures of wrought iron and steel. It will give employment to 25,000 men. The official and financial headquarters will be at New York, manufacturing headquarters at Pittsburg, foreign office in London.

The company controls these plants: National Tube Works Company, McKeesport, Pa.; Riverside Iron Works, Blast Furnaces, Rolling Mills and Pipe Works, at Wheeling, W. Va.; United States Seamless Tube Company, Christy Park, Pa.; National Rolling Mills, McKeesport, Pa.; American Tube and Iron Company's plants, at Youngstown, O., and Middletown, Pa.; National Forge and Iron Company, McKeesport, Pa.; Pennsylvania Tube Works, Pittsburg, Pa.; Boston Iron and Steel Company, McKeesport, Pa.; Allison Manufacturing Company's Tube Mill, at Philadelphia; Monongahela Furnaces, McKeesport, Pa.; Morris Tasker & Company's plant, at New Castle, Del.; Republic Iron Works, Pittsburg, Pa.; Oil Well Supply Company's Continental Tube Works and Elba Iron Works, at Pittsburg, Pa.; National Galvanizing Works, Versailles, Pa.; Chester Pipe and Tubing Company, Chester, Pa.; Monongahela Steel Works, McKeesport, Pa.; Hooven Plant, at Norristown, Pa.; Oil City Tube Works, Oil City, Pa.; Syracuse Tube Works, Syracuse, N. Y.; Ohio Tube Company, at Warren, O.; Western Tube Company (contract until 1902 and 1/3 stock ownership), Kewanee, Ill.

#### TRADE CATALOGUES.

The Buffalo Forge Company, of Buffalo, N. Y., issues a number of little catalogues describing the fans, blowers, exhausters and high speed engines that it manufactures. The illustrated general catalogue is a compact little volume of 398 pages. It contains brief descriptions and specifications of engines and fans as well as forges, drills and bar cutters, blacksmith tools, and fan systems of ventilating, heating and drying. A little 8-page circular shows various types of Buffalo down-draft forges; another illustrates center and side crank horizontal and single and double upright Buffalo automatic engines. The company sends its catalogues on application.

Fraser & Chalmers of Chicago and London have issued a 4th edition of their catalogue No. 3 entitled "Roasting, Smelting and Refining Methods and Machinery." This edition contains 168 pages and the general excellence of its cuts and typography make it one of the best of the series issued by the firm. The catalogue shows samples of various types with plans of sampling works, roasting kilns and furnaces, including the Guyer, especially adapted for small plants and easily roasted ores; the smelting furnaces for dry sulphide ores, silver-lead ores and copper ores (among new features are shown welded steel water jackets for copper or lead furnaces); blowers, forehearth, slag-pots and slag-cars; also plans and specifications for a 30-ton copper smelting plant; copper converting machinery, including trough converters; hydraulic transfer cars and turn tables; copper refining plants, copper cupelling plants and lead refineries.

The Waterbury Rope Company of New York City, makers of all kinds of rope, issues an illustrated catalogue of 48 pages that is out of the usual run of trade catalogues. It contains a condensed history of rope making, brief description of the plants that furnish Manila hemp and Sisal hemp, and a popular account of the process of rope making, as carried on by the

Waterbury Company. Two of the company's specialties are "Waterbury" Manila transmission rope and "Waterbury" hoisting rope. These are made, it is stated, with 4 strands and the twist of the yarns and lay of the rope is made to correspond with the work, either rope driving or hoisting. The yarns are coated with a special composition that lubricates the fibres, insuring long life. The company's rope for drilling wells is said to be composed of 3 strands, with a very hard lay, so that they will not untwist and will resist the friction against the side of the well. The catalogue contains an interesting chapter on rope transmission, the lubrication and wear of ropes, the construction of pulleys and directions for splicing ropes.

#### MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" 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 and selling goods of any kind.

#### GENERAL MINING NEWS.

##### ARIZONA.

###### Mohave County.

Elkhart.—This group of mines, near Chloride, is owned by a Scotch syndicate; Dr. Theo. B. Comstock is superintendent. The Elkhart, the principal claim, has had over 3,500 ft. of development work done on it; the shaft is down over 200 ft., and the mill is running steadily. There are 45 men employed. The shaft will be sunk 600 ft., and a new shaft for cage-hoisting will be started at the level of the mill to connect with the main shaft. At present 200 tons of concentrates are shipped monthly, and the mill will be worked to its capacity of 80 tons per day.

Sheeptrall.—These mines in Union Pass District, across the Colorado River from Kingman and near Bullhead Rapids, are reported bonded to New England & Arizona Mining Company. A 10-stamp mill is at work on the property.

##### CALIFORNIA.

###### Amador County.

(From Our Special Correspondent.)

Bay State.—Exploration is continued at this mine near Plymouth. The vein is to be crosscut and drifts run. The shaft, now down 700 ft., will be carried to the 1,000-ft. level.

Centennial.—At this mine, near Drytown, operations are being pushed. At the 700-ft. level a crosscut is being run west to the vein and the pump is being cleaned out to enable them to continue sinking. The bulkhead at the 300-ft. holds the water back. About 30 men are employed under Superintendent Robert Read.

Cooley.—This mine, together with the Mt. Echo, Schmitt & Burns and the Nugget, all located near Ione, are being successfully worked. As high as \$800 are reported to have been taken out of the latter in one day.

###### Calaveras County.

Fort Wayne Gold Producing Company.—This company's property at San Andreas, a gravel mine, supposed to be valuable, was recently attached to secure claims for \$3,000 due workmen on wages. J. F. Clapp was superintendent. (From Our Special Correspondent.)

Boston & California Gold Mining Company.—This company has been organized by Sydney Smith and Senator De Vries with a capital of \$250,000 to work the old Garner Mine, on the Mokelumne River, one-half mile east of Big Bar bridge. The 10-stamp mill is running on ore from the lower tunnel. The property has been idle for years on account of friction between the owners. A valuable ore body has been encountered in the lower tunnel, the assays averaging \$20 per ton.

###### El Dorado County.

(From Our Special Correspondent.)

Doncaster Group.—This property, near Kelsey, has been bonded by Sydney Smith and George W. Hall, who are putting in a large hoisting plant to enable them to sink to 500 ft. The property comprises the Cleveland and Red Hill claims, which produced largely in early days.

Gardner Consolidated.—This property, near Placerville, is being developed by W. Meyers. The workings consist of a 500-ft. tunnel and about 500 ft. of drifts. A drift is now being run east to tap the ore shoot, which assays on the surface about \$18 per ton.

Griffith Consolidated.—This group of mines, south of Placerville, has been purchased by the Jumper Mining Company for \$76,666. The prop-

erty has been developed on a large scale. A large mill is up and an electrical plant has been installed.

#### Kern County.

**Yellow Aster.**—This company has paid dividends as follows: May, \$15,000; June, \$5,000; July 10th, \$10,000. This brings the total amount paid up to date to \$233,789. The company's new mill is now running steadily and crushing 140 tons a day.

(From Our Special Correspondent.)

**Little Butte.**—This mine, at Fiddlers Gulch, 1 mile north of Randsburg, is yielding well. A clean-up of 8 days' run on ore milled at the Red Dog Mill, netted \$1,021. About the same amount has been cleaned up since.

#### Marin County.

**Crown Hill Mining Company.**—The copper mine of this company at Bolinas is reported bonded to a syndicate for \$200,000. The mine is 3 miles northwest of Bolinas on the south side of Mount Tamalpais. A large amount of development work has been done on the property, which was leased to J. W. Pearson of San Francisco, and considerable ore has been shipped to the Selby Smelting Works. The ore is low grade.

#### Riverside County.

(From Our Special Correspondent.)

**O. K.**—The shaft at this mine, in the Virginia Dale District, is down 230 ft. On the 200-ft. the vein shows 41 ins. for over 100 ft. A 130-oz. gold brick was recently shipped.

#### Shasta County.

(From Our Special Correspondent.)

**Mountain Copper Company.**—The property of this company, comprising mineral lands, railway, smelters, etc., has been assessed at \$1,066,720 by the county assessor. This is an increase of \$700,000 over that of last year. This is the largest assessed valuation placed on any mining property in the State.

#### Siskiyou County.

(From Our Special Correspondent.)

**Schroeder.**—This property, in Deadwood District, about 7 miles west of Yreka, is reported to have been sold to the Canada Mining Company. The ledge has been tapped at a depth of 1,200 ft., and development work will continue under the management of J. H. C. Schroeder, the former owner.

#### Tuolumne County.

(From Our Special Correspondent.)

**Boston Gold Mining Company.**—This company is making arrangements to put in a large sinking plant to carry the shaft down an additional 500 ft. Several tons of ore have been shipped to San Francisco to be tested. The ore came from the old workings. This is the old Draper Mine, near Soulsbyville. G. F. Dyer is superintendent.

**Longfellow.**—At this mine, north of Big Oak Flat, a 70 H. P. boiler has been added; also new pumps in the shaft, which is down 320 ft. The mill is running on good rock. About 30 men are employed.

#### COLORADO.

##### Gilpin County.

(From Our Special Correspondent.)

**Mine Outputs.**—Concrete Mine produced 1,485 tons in June and the Kansas-Burroughs Consolidated Mining Company produced 3,630 tons.

**Mining Transfers.**—Gilchrist & Dickerson, lease and bond to Mountain Monarch Mining and Development Company, on Independence, Gettysburg and Charleston claims; B. E. King, et al., to T. K. Murray, et al., of Denver, a lease and bond in the sum of \$23,500 on Greenwood, Dinglebender, Crossing and Jarvis lodes; J. B. Hill to Dr. W. E. Rammel, of Denver, ½ interest Monarch Lode; D. Wagner to Wm. Dee, Denver, ½ interest in Isabella Lode; A. H. Gaspell to the Co-operative Yukon Mining and Trading Company, the John Bishop, Little Annie, Gold Brick and London claims; W. H. Davis to Ridgewood Mining Company, the Rialto property, with improvements, \$40,000; R. Rutledge, St. Louis, Mo., to The Blagdon Mining Company, the Effie, Blagdon, Ezra White, Glen, North Eclipse and Charter Oak Lodes; A. J. Smith to W. S. Deisher, ½ interest Maud D., Grace D., Florence D. and Dorothy Lodes; Bates-Hunter Consolidated Gold Mining Company to F. A. Potts, of New York, west ½ of discovery claim and claims No. 1 and No. 2 on Bates Lode, west of discovery claim in Gregory District; C. W. Deems to H. W. Granfield, New York, the Pure Gold and Gibraltar Lodes; H. M. Joralmon to E. R. Genaway, a ½ interest in Golden God, Calumet & Hecla No. 2 Lode claims; H. C. Rawson to E. Quigley et al., lease and bond, sum of \$15,000, on Imperial Lode.

**Ore Shipments.**—In June there were shipped from this county 280 cars of ore, or 5,110 tons, which represented the smelting ore and tailings product. Compared with the same month of 1898, the shipments show an increase of 500 tons, a gain of 12%.

**A Pyritic Smelter.**—There is some talk of the Boston Copper-Gold Smelter Company building

a Loder pyritic smelter at Central City to treat the low grade pyritic ores of this and Clear Creek counties.

**Fisk Mining Company.**—Sinking has started at over 100 ft. on another lift. Employment is given to 60 men, and the daily shipments average 70 tons. L. H. Stockbridge is manager.

**Gibson.**—Illinois parties have taken a 2 year lease and bond in sum of \$11,000 on the Gibson group. A new shaft house 25 by 40 ft. is being put up and a new plant of machinery will be installed. J. Franks is manager.

**Gilpin & Cripple Creek Gold Mining Company.**—This company has filed a certificate of full paid stock, which is \$1,000,000 in \$1 shares. J. S. Gould, C. C. Doly, E. J. Knight, F. E. Higgins and R. C. Bogy are directors.

**Gunnell.**—The Cornish pump has started and good progress will be made in unwatering.

**Maine & Hamlet.**—A mill vein of high grade ore has been opened up in sinking the shaft, which gives assay values of over \$400 per ton. S. Brereton is manager.

**North Downs Mining Company.**—Another lift of 100 ft. is to be sunk with air drills. Massachusetts parties are interested with L. H. Stockbridge, manager.

**Sub-Treasury Mining Company.**—This company has been organized to work the Sub-Treasury and Cecil Lodes in Russell District. R. C. Benight is manager.

**West Gregory.**—In sinking this shaft returns of 80 oz. gold per ton have been obtained. E. Quigley is looking after the property.

#### Lake County—Leadville.

(From Our Special Correspondent.)

**Smelter Situation.**—It is believed that following a decision on the constitutionality of the 8-hour law, which is looked for by the 17th, there will be a general start-up of the smelters. The Arkansas Valley has announced that it will not do anything until there is a decision. Some repairing is going on and when work is resumed the smelter will be able to handle an enormous tonnage. It is intimated that the old Union Smelter, which was purchased by the smelter trust, will resume work after a settlement is reached. This was erected by Ed. Holden a few years ago at a cost of \$75,000. The Bimetallic is running about full force, with all its furnaces in operation. The men are perfectly willing to work until the law is passed on and then settle the wage question. The fact that the smelter employees in this camp are not organized it is thought will make starting up simple, as the employers will deal directly with their men and not through a labor union, as in Denver and Pueblo.

**Adams-Maid-Wolftone Mining Company.**—This is the new company to operate the 3 claims mentioned in the title. The articles of incorporation show the capital stock to be \$50,000. The incorporators are S. D. Nicholson, L. A. Reynolds, Julius Rodman, R. J. Donnen and Patrick Crowe. The company will explore the lower contacts. The Wolftone shaft is to be sunk deeper.

**All Right.**—Hahnwald & Company, lessees, are shipping manganese ore to the Illinois Steel Company on a contract.

**Alps Consolidated Mining Company.**—It is reported that this New York concern contemplates resuming work on the Alps and the Helvetia claims. Operations through the Columbus shaft last year resulted in finding good ore at 175 ft., the stuff running as high as 36% lead, but owing to heavy water work had to stop.

**American.**—This property has been started up by lessees. It lies west of the Lillian, in Iowa Gulch, and shows a large body of low grade gold ore.

**Ballard.**—The company has filled its bins with ore and now confines itself to development. Two 8-hour shifts are opening a fine ore body, while prospecting goes on.

**Big Six Mining Company.**—Englebach & Co., lessees, have enlarged the old shaft, put in new machinery, and are opening up a very large ore body to ship 75 tons per day.

**Coronado Mining Company.**—The mine has been drained under the direction of the Leadville Pumping Association, and the owners will resume shipments as soon as the smelters start and can handle a tonnage of 100 tons daily. They have 2 levels at 530 and 550 ft., the former connecting with the great low grade ore bodies opened up in the Sixth Street shaft.

**Fortune Mining Company.**—This company, working the Penfield, Fortune and Judge Bowen claims, has begun shipments from a good body of lead ore opened at the 670 ft. level, similar to that opened up in the Resurrection and Sedalia.

**Hill Top Mining Company.**—Under the management of A. F. Wuensch, shipments from the big lead ore bodies will be large. No trains have been able to get near the company's ground all winter, owing to the terrible storms. The mine and the mill will be worked full capacity from now on.

**Home Mining Company.**—The company having drained its territory, is prospecting with good results. The sinkers have been removed from the Penrose and its big pump is now handling the water.

**Little Bob.**—Manager Geo. Campion is putting a fine plant of machinery in position preparatory to development. Past development has uncovered a large body of free-milling gold ore, but it is necessary to get out the water and do some more sinking before the mine can be worked to advantage.

**Modoc.**—Lessees are working a large body of iron ore at the 640 ft. level.

**Moffat Group.**—It is hinted that these claims, 80 acres, on Rock Hill, are to be sold, including the Nil Desperandum, where Thos. Owens et al. opened up rich ore some years ago.

**Morning Star.**—This is the largest producer in the camp to-day, owing to the smelter shut-down. The Guggenheims are taking nearly 200 tons per day. The Lee, Dunkin and a few other leases will also ship small tonnage to the Guggenheim plant.

**Red Mountain.**—This section is 12 miles west of Twin Lakes. A strike is reported of a gold tellurium ore, something new, for that locality. Several dozen miners at once started for the place. The assays brought in show an average of 5 oz. gold to the ton, and the pay streak is said to be 1 ft. wide with the vein 5 to 15 ft.

#### Summit County.

**North American Dredging Company.**—In addition to the 2 dredges worked last year on the bed of the Swan River, 2 new ones are in course of construction, 1 being a Risdon and 1 a Bucyrus. The company is prospecting its ground with a steam drill and new ditches are being constructed to carry water for the grants it expects to have in operation before long.

#### Teller County—Cripple Creek.

**Smelter Strike.**—There seems little change in the situation, and probably nothing will be done toward a settlement of the troubles until a decision is received from the Supreme Court in regard to the constitutionality of the 8-hour law. In the meantime work goes on much the same as usual in this district. Many of the mines gave a holiday for 2 and in some cases for 3 days in order that their men might attend the celebrations last week.

**Acacia Gold Mining Company.**—Quite a body of good ore has been struck on the 5th level of this property by Curriel & Company, who are sub-leasing on the Burns Claim. The whole claim is under lease to Hankey & Cole, of Bowling Green, O. The Burns is one of the oldest locations on Bull Hill, and adjoins the Pharmacist. The ore is found in a drift from a winze from the 4th level.

**Alamo Mining Company.**—It is reported that this company has sold 10 acres from the north end of its property to a Philadelphia syndicate. The reported price is \$50,000, divided into 5 payments of \$10,000 each. There have been a number of rumors about this sale for some time, but now it seems as if it had been really made. The Alamo Company still has considerable ground left on Gold Hill.

**Elkton Consolidated Mining and Milling Company.**—Reports are floating round that this property is soon to be taken over by the Venture Corporation of London. While nothing certain is known, it would seem that there must be some thoughts of this. Engineers are examining the property, and little besides sinking is going on. The presence of a number of the members of the Venture Corporation in the district adds color to the reports.

**Matoa Gold Mining Company.**—This company is working the Half Moon property itself. Some drifting is being done and sinking will soon begin. The company has bought the machinery at the mine from Carl Johnson. The property is on Gold Hill, and made a splendid record as a shipper when under lease by Mr. Johnson. For the past few months, however, but little ore has been shipped, as the lease was too nearly out to admit of any more development. R. H. Burrows, of Cripple Creek, has charge.

**Montreal Gold Mining Company.**—The Fluorine Claim is again worked under lease by Milo Hoskins, formerly superintendent of the Anacosta, and another gentleman. What appears to be some good ore has been opened up, and a trial shipment of 2 carloads has been sent out. The claim is on Copper Mountain and was a steady shipper during '98, when it was worked by J. A. McClurg, of Denver.

**Union Gold Mining Company.**—The annual meeting was held at Colorado Springs during the week, and the following directors were elected: J. A. Sill, J. F. Burns, A. S. Holbrook, E. R. Stark, Richard Clough, G. O. Tapley and C. H. White. At a subsequent directors' meeting J. A. Sill was chosen president, A. S. Holbrook vice-president and C. H. Morse secretary and treasurer. The reports of the officers show the company to be in good shape. The treasurer's report shows about \$3,500 in the treasury. Over



\$34,000 worth of development work was done during the year, mostly by lessees. The output for the year was (gross) 2,903 tons of the average value of \$45.44 per ton. All the ore was produced by the lessees. The Orpha May or main working shaft is now down 900 ft. Harold Starkweather has charge of the mine.

**IDAHO.**  
**Idaho County.**

**Buffalo Hump District.**—The snow is off the ground and prospectors are busy. A new trail has been opened to the district from Grangeville, making it much easier to get to the district. Many locations were made last winter by prospectors when the snow was 20 ft. deep, and these will provoke some trouble. On the Monte Cristo, owned by Norman & Cameron, 10 men are at work. The Buffalo Hump Development Company has started work on the Fortune. Some promising new strikes are reported.

**Hiyu.**—This mine, near Florence, closed down for some time, will, it is said, be worked again, with A. D. Wheeler as manager and 16 men. The main shaft is down 230 ft. At the 100-ft. the pay shoot is 14 in. wide. At the 200-ft. level it is over 2 ft. The ore is free-milling and runs from \$16 to \$30.

**Owyhee County.**

**De Lamar Mining Company, Limited.**—Manager D. B. Huntley's report for May states that 4,825 tons of ore were treated at the cyanide plant, yielding 1,648 oz. gold and 4,031 oz. silver. The ore assayed \$9.46 gold and 90c. silver and the tailings \$2.04 gold and 50c. silver. The total estimated receipts were \$36,225, and expenses \$30,780, leaving a net profit of \$5,445.

**Shoshone County.**

**Mining Conditions.**—With every week that law and order are enforced by military rule the power of the Miners' Union grows less. Enough men are coming in from outside to keep all the mines busy. In case the county commissioners, as well as the sheriff, are impeached and removed from office, new officials not in sympathy with the lawless rule of the union will be appointed. Whether or not the State secures conviction in the cases of the 300 men held for complicity in the riots of April 29th the prospects for better conditions in the Cœur d'Alene are much more promising than they have been.

**Empire State.**—This claim and several adjoining it have been bonded by the Wemes Brothers to J. T. Argyle for \$75,000. The claim is near the Sixteen to One, and considerable development work has been done, showing some good concentrating ore.

**Empire State-Idaho.**—At the Last Chance claim, at Wardner, the bosses, millmen and engineers were recently required to take out permit cards, as they were union sympathizers, or leave the company's employ. All left but one boss. New engineers and millmen were secured.

**Mammoth.**—This mine resumed work with a crew of 30 men, and about 40 men have since arrived from Joplin, Mo.

**Montana Copper Mining Company, Limited.**—Boston parties are reported to hold an option on the entire stock, 1,000,000 shares, of this company, which owns a group of claims in the copper belt on Stevens Peak. The group is near the Springfield, for which the same Boston parties are negotiating. The option on the Montana Company's stock is at 5c. per share.

**Pritchard Creek Placers.**—It is stated that Barry Hillard, of Wallace, on behalf of Boston men, has taken options on placer ground, along Pritchard Creek from 3 miles above Murray to a point 6 miles below; all of the old wash of Wisp Gulch above Murray over to Fancy Gulch and Eagle Creek, a distance of 7 miles, with all tributary gulches, and all of Eagle Creek. Mr. Hillard secured the property of the Spokane Hydraulic Company. In addition to the placer ground and water rights, there is 7 miles of 22-in. steel pipe. In addition to the ground in the bottoms of the gulches, there are old channels from 200 to 600 ft. above the present level of the gulch, which the Spokane Hydraulic Company was organized to work. The total outlay for the property and putting it in shape will, it is said, be \$750,000. The ground will be worked by dredges and hydraulic elevators, the ordinary hydraulic method being used on the high bars.

**Sixteen-to-One.**—This claim, near Wallace, is being worked again. The miners have secured permits.

**Tiger-Poorman.**—All the union pump and hoist men at this mine, near Burke, have been replaced by non-union men.

**MICHIGAN.**  
**Copper.**

**Copper Range Railroad.**—About 500 men are now at work, and every section is covered. The maximum grade out of the lake at Houghton is stated to be 1.8%. It is expected that the road will be ready for business by November 1st.

**Mass Consolidated.**—At the Minnesota mine, near Rockland, surface improvements continue.

A compressor plant will soon be in position. At A shaft miners are drifting under old workings between old Nos. 4 and 5 shafts. This is the portion of the mine which produced the famous large mass of copper. Sinking has been resumed at B shaft. A shaft is 310 ft. deep. B shaft is 320 ft. deep. About 120 men are at work under Superintendent Brady.

**Union Copper & Land Company.**—At the annual meeting in Boston, with President H. F. Fay in the chair, the old directors were re-elected. The report of Treasurer W. B. Mosman shows: Cash balance, June 1st, 1898, \$484; receipts from old assessments, \$6,819; from sale of old delinquent stock, \$6,419; sale of lands and treasury stock, \$180,000; interest and deposits, \$884; total, \$194,606. Expenses: Office rent and expenses at Michigan and Boston, including legal services and commission for sale of lands, \$11,207; incidental expenses, \$529; taxes, \$1,700; due individuals from auction sale of delinquent stock, \$1,926; exploration work and machinery, \$4,850; cash dividend, \$40,000; balance, May 1st, 1899, \$134,393. The changes made in the by-laws embraced the changing of the date of the annual meeting to the fourth Thursday in March, and the authorization of the directors to sell and convey land of the company in the counties of Keweenaw, Houghton, Ontonagon and Gogebic.

President Fay stated that the directors had no detailed report of operations for the year. He said that during the year land which had been regarded as practically of no value by the old management had been sold by the present one for \$500 per share, 320 acres having been sold to the Old Colony Mining Company, from which stockholders had received a dividend amounting to practically \$3 on a cash basis. Forty acres were also sold to the Mayflower. At present certain parties have an option on 320 acres at \$160,000, which does not expire until October 1st. Other parties practically hold options on 400 or 500 acres around Portage Lake. There have been inquiries for other parcels.

**Iron—Marquette Range.**

**Bessie.**—This mine at Humboldt, which has been idle some years, is now leased to the Oliver Mining Company, which has started to pump it out and overhaul the machinery.

**Cleveland-Cliffs Company.**—This company has an option on the Hartford, near the Cambria and Lillie at Negaunee, and may buy the property. The Hartford is not an idle property, and its manager, Benjamin Neely, of Negaunee, has pumped it out this spring.

**Pittsburg & Lake Angeline.**—The company is exploring for iron near the shore of Iron Mountain Lake at Ishpeming.

**Iron—Menominee Range.**

**Antoin Ore Company.**—This company is shipping 600 tons of ore daily from the Clifford Mine near Iron Mountain, and employs 85 men.

**Appleton.**—John T. Jones, of Iron Mountain, and W. H. O'Brien, of Chicago, have leased this mine at Waucedah, adjoining the Loretta. It has been idle since 1894, when the boiler house burned down and the fee holders went into litigation.

**Aragon.**—The hoisting plant at No. 1 shaft at this Norway mine and the new steel shaft house are ready for work.

**Hollister.**—This mine, near Cristal Falls, is to be worked this year by P. E. Dunn and John Hooper, who have an option on the property and are preparing to unwater the workings. The last work done was in 1892 by Negaunee parties. In the third, the lowest, level the ore was found 29 ft. thick.

**John T. Spencer,** with Appleton, Wis., men, has secured from the Lake Superior Ship Canal Company an option on 10 forties adjoining the Ludington Mine at Iron Mountain, on the north and east, and has started exploration work. He has also taken an option on some land in Section 21 near Iron Mountain, extending from the Cuff to the Trader Mine and test pits are being sunk.

**Keel Ridge.**—At this mine near Iron Mountain 35 men are taking out 70 tons of ore daily, which goes to the Minerva Furnace at Milwaukee by rail.

**Varona.**—The Hemlock Mining Company, backed by Pickards, Mather & Company, has leased the old Southeast Vulcan Mine at Norway and renamed it the Varona. A force of men has been overhauling the machinery, and the mine will be pumped out. Chas. E. Lawrence will be superintendent.

**MISSOURI.**

**Jasper County.**

(From Our Special Correspondent.)

**Joplin Ore Market.**—All the mills in the district, which shut down for 2 weeks, have resumed work, and there will be an enormous output this week. There are probably 2,000 tons still unsold, and the smelter manufacturers show no disposition to purchase a pound of ore above actual necessities, claiming they are afraid to stock up heavily for fear of a slump in the metal market. Their policy is a waiting one, and until the Ore Producers' Association announces some

definite policy in regard to the future price of ore conditions will be more or less unsettled. The directors of the association are considering a proposition to fix the price of ore for 6 months in advance, and, should a majority of the producers enter into an agreement to that effect, the arrangement would probably be more satisfactory to the smelting interests than present conditions, as it would enable them to make contracts for future delivery without the large element of risk now existing. The price for top grade zinc ore was \$43 per ton, and a large amount of ore sold at this figure, including the ore from Oronogo, Cave Springs, Alba, Hells Neck, Wentworth, and several cars from Joplin. Lead was unchanged, selling, as for weeks past, at \$26 per 1,000.

During the corresponding week of 1898 top grade zinc ore sold at \$28 per ton and lead at \$23.75 per 1,000. The output of lead for the week was greater than last week by 404,000 lbs., the zinc sales were less by 368,960 lbs., and the value was less by \$44,474. For the first 27 weeks of last year the lead sales were greater by 5,449,610 lbs., the zinc sales were less by 65,227,070 lbs., and the value was less by \$2,698,265. As compared with the previous week, the sales were less by 2,445,910 lbs. of zinc, 305,700 lbs. of lead, and the value was less by \$51,144. Following is the turn-in by camps:

	Zinc. Pounds.	Lead. Pounds.	Value
Joplin	879,670	143,800	\$22,147
Galena-Empire	1,878,790	101,770	36,464
Webb City	735,560	11,160	14,895
Cartersville	897,220	65,750	19,714
Belleville	237,940		4,397
Central City	235,450	4,050	1,344
Oronogo	870,210		17,788
Duenweg	149,500	13,730	3,046
Stotts City	327,240		7,636
Hells Neck	183,590	27,310	4,778
Cave Springs	31,330	16,250	1,128
Alba	126,600		2,722
Aurora	947,000	30,500	14,330
Wentworth	43,500		914
Springfield	87,550		1,838
Total for week	7,634,650	414,320	\$155,840
Total 27 weeks	274,327,570	24,348,530	\$5,925,879

**Mining Land Sales.**—The S. A. Miller land at Lehigh, consisting of 53 acres north of the O'Keefe land, has been sold to Illinois parties for \$10,800. New York parties have purchased the Bryan & McKinney Mine, in Gordon Hollow, for \$10,000. The Missouri Land and Live Stock Company, of Neosho, better known as the "Scotch Company," sold 5,879 acres of land in Newton County last week to a New York syndicate for \$48,430. They also sold to the same syndicate about 14,000 acres of land in McDonald for \$8 per acre. The American Zinc, Lead and Smelting Company has purchased the mills, leases and other property of the Silver Dick Mining Company and Howell, Crowley & Company, including 10 acres of land on the tract of the Centre Valley Mining Company at Oronogo, for \$90,000. George W. Lane has sold to W. W. Knight, of Kansas City, 40 acres of land at Lehigh for \$6,000. J. W. Ground, representing Eastern parties, has purchased 17/20ths of the Roaring Springs lease, southwest of Joplin, for \$70,000. The mill and sub-lease of 7 lots on the Troup ground at Cartersville, belonging to the Standard Mining Company, have been sold to F. C. Heald and others, of Washington, D. C., for \$50,000. W. E. Patton was the principal owner. A. B. Wilgus has sold to Eastern parties the mill and 6 acres of the Eureka Mining Company at Galena. The consideration was not made public. The Bowman Mine and 2 lots in West Joplin have been sold to New York parties for \$10,500.

**MONTANA.**

**Broadwater County.**

**Diamond Hill.**—This mill, at Hassel, made its first clean-up this season recently. It is said \$28,000 was realized, which considerably exceeded expectations.

**Cascade County.**

**Yogo Sapphire Mines.**—It is stated that Matt Dunn, of Great Falls, has bonded his Yogo sapphire interests to English investors. P. T. Sweeney, of Nelhart, also has heavy interests in the sapphire mines of Yogo.

**Granite County.**

**Mussigbrod Mill.**—This mill at Garnet, owned by Dr. Peter Mussigbrod, is running on ore from the Lead King, and on custom ore. The first-class ore goes about \$250 per ton, and the concentrates \$150.

**Nancy Hanks.**—This mine at Garnet is being worked in a small way. Owing to high freights, base ores of less than \$12 do not pay to ship.

**Jefferson County.**

**Bonanza Chief.**—George T. Wickes is sinking a new shaft on this claim a short distance from the old one, and is prepared to do considerable work.

**South Boulder Mining Company.**—Recently a party composed of H. M. Carpenter, D. E. Johnson and C. J. Traxier, of Minneapolis, and L. H. Stiles, E. C. Sheldon, Daniel Densmore and J. F. Porter, of Red Wing, Minn., visited the property near Whitehall. At the annual meeting, at Whitehall, it was decided to carry the

work of development forward, and to open up the Densmore Claim in addition. The officers are: President, H. M. Carpenter; first vice-president, W. M. Fergus; second vice-president, C. E. Sheldon; treasurer, L. H. Stiles; assistant treasurer, A. A. Needham; secretary, C. D. Wilkinson; manager, H. C. Cutler. The officers were made the directors.

#### Lewis & Clarke County.

**Free Coinage.**—This mine, in Lump Gulch District, near Helena, is making regular shipments of several cars of ore weekly to the East Helena smelter.

#### Silver Bow County.

(From Our Special Correspondent.)

**Butte & Boston.**—At the East Gray Rock sinking from the 1,600-ft. will begin immediately and will be continued for 300 ft. This mine is now sending out regular shipments of ore daily.

**Boston & Montana.**—At the West Colusa many surface improvements have been made of late, including a large blacksmith shop. At the 1,000-ft. level a large duplex steam pump has been put in, capable of throwing water to the surface. Sinking is now in progress. At the 800, 900 and 1,000-ft. levels drifting west is being carried on, while at the 500, 3 crosscuts are being pushed to the hanging. A double track is being laid at the 200-ft. level to carry ore from a large body, 100 to 150 ft. wide, already blocked out. Owing to a fall of ground between the 100 and 200-ft. level work on No. 5 raise, close to Davis shaft, has been abandoned. From the 200 to the 100-ft. level another raise has been put through which will be used for waste rock, timbers, etc. From the top of the raise drifting between the two ledges is being pushed east to connect with the shaft, where a small station will be cut. When this is completed the drift will be continued west to the boundary line of the Mountain View. The usual amount of ore is being taken from all the Colusa properties.

#### NEVADA.

##### Storey County—Comstock Lode.

**Consolidated California & Virginia.**—The report for the week ending June 30th states that the pocket of ore on the 1,750 ft. level extended but a short distance above where it was struck. "The ore going west assays from \$2 to \$25 per ton. The ore in the unworked ground goes off sharply to the west and dips below the track floor of the 1,750 ft. level. In making room to work and while stopping ore we have extracted during the week 100 tons of ore of a gold value of \$16.75 per ton and about 15 tons of \$9 ore that was separated from the higher grade. The station on the 1,800 ft. level seems to be in good condition, but it is not possible to state how soon development work can be started. The water is again down near the 1,950 ft. level and we hope soon to open that level."

#### NEW JERSEY.

##### Morris County.

**Hurd.**—At this mine, at Port Oram, on July 7th, Superintendent Edwin Mills and 2 miners—W. Murtha and F. Shiffner—were killed by an explosion of gas, which wrecked a mine dam on No. 1 level, letting a flood of water down on the men. The men were getting the water out of the old workings, idle for years, and the explosion was probably from gas from the decaying timbers.

##### Sussex County.

**Sussex Zinc Company.**—The Newton "Herald" says: "This new corporation is now at work on the old Fowler property on the road leading from Sparta to Ogdensburg, prospecting for what they expect will prove a rich deposit of ore. W. J. I. Kemble is in charge of the work, and as the work progresses it is the intention of the company to employ a large force of men. There is said to be unlimited capital to push the work."

#### NORTH CAROLINA.

##### Cabarrus County.

(From Our Special Correspondent.)

**McMackin.**—This gold mine, owned and worked by the Whitney Reduction Company, had its principal hoisting works burned to the ground on July 9th. Loss, \$10,000 to \$15,000. Col. E. B. C. Hambley, the manager, says the company will rebuild at once.

#### OREGON.

##### Baker County.

**Pomeroy Dredge Company.**—This company has begun operations near Weatherby. The main boat is 100 by 34 ft., and is accompanied by a tender 28 by 32 ft., which helps support the steel flume. It will mount 2 75-h. p. boilers and 4 engines and a centrifugal pump throwing 11,000,000 gals. in 24 hours. The entire plant will be lighted by 2-arc and 50 incandescent lights. The capacity of the plant will be 2,000 cu. yds. every 24 hours.

#### PENNSYLVANIA.

##### Anthracite Coal.

Mine foreman's certificates have been given to the following men in the Hazleton District:

**Arthur T. Watt**, of Nesquehoning; **Thomas E. Morgan**, of Gowen; **David Spence**, of Hazleton, and **Arthur J. McFugn**, of Gowen.

**Langcliffe Coal Company.**—This company, which has mines at Greenwood, near Scranton, has brought suit against the New York, Susquehanna & Western Coal Company, in reality the New York, Susquehanna & Western Railroad Company, to recover \$350,000 for alleged breach of contract in not taking the amount of coal called for in a certain contract and in not paying the prescribed price.

**Lattimer No. 1.**—This colliery at Hazleton, which has been idle several months, has resumed work. The new breaker is completed.

**Lehigh Valley Coal Company.**—The strike at the company's collieries, near Wilkes-Barre, which was brought about by the company's insisting that miners in the gassy Baltimore working of the Dorrance Shaft should use Wolfe safety lamps, has ended by the men returning to work. The company refused to yield to the men, asserting that its regulations were designed to protect life and property, and the men resumed work on the terms offered by the company.

**Marian Coal Company.**—This company's plant, at St. Clair, near Pottsville, has been purchased by a Scranton syndicate. The plant is to be improved and worked.

**Oak Hill Coal Company.**—This company has sold 4 dumps at Moosic to G. M. Hallstead and D. J. Whiteford, who will put up a large washery. The dumps accumulated 30 or 40 years ago.

**Philadelphia & Reading Coal and Iron Company.**—This company's collieries about Pottsville worked 6 days last week, and it is said that they will be far busier than usual all summer. The company is pushing work on its new breaker at Locust Gap, and has a large force of men sinking the shaft.

##### Bituminous Coal.

According to Pittsburg papers, James W. Ellsworth of New York has purchased the Pigeon Creek, or Bentleyville, coal fields. Shafts will be sunk and when in working order the mines will have a daily capacity of 6,000 tons. This tract comprises many thousand acres of accessible coal, easy to develop and within easy reach of the market.

The operators of the entire Beech Creek region have agreed to advance the price of machine mining to 27½c. per ton. This is the conclusion of the Clearfield conference of June 1st, when the 50c. pick rate was established and the 5-9ths differential for machine work held over. This agreement is to hold for one year from August 1st.

The strike of the soft coal miners in the DuBois District is finally settled, and all the mines will resume at once. The terms agreed upon are the same as the operators offered at the beginning of the strike. An advance is given to 45c. per ton for pick mining, and 22 1/3c. per ton for machines. Drivers and laborers receive an advance of 10 per cent. The agreement is to continue in force for 1 year. It also provides that in the event of an advance in competing regions the miners of this region will be given a proportionate advance. The scale is the highest that has been paid in the region for several years.

The Reading Iron Company, which is controlled by the Reading Railroad Company, has bought 9,000 acres of soft coal lands in Somerset County, according to press dispatches. The Somerset & Cambria Railroad, a branch of the Baltimore & Ohio Railroad, passes through the property. This road will convey the output, and the Baltimore & Ohio Railroad Company will have a haul of 129 miles to Cherry Run. From this point the coal will be taken over the Western Maryland Railroad to Shippensburg, where it will be delivered to the Philadelphia & Reading Railway. The distance from the mines to the company's works at Reading is 277 miles.

**Millwood Coal Company.**—This company at Millwood has increased the wages of its miners from 36c. to 38c. a ton for run of mine coal and increased the pay of drivers from \$2 to \$2.10 per day.

(From Our Special Correspondent.)

**H. C. Frick Coke Company.**—This company, the great concern of the Connellsville region, has completed 50 new coke ovens at the Oliphant plant, and has connected the old ovens at Fairhance with the mine at Kyle, and fired the idle ovens. The same company is erecting a long trestle at the Bessemer plant; when it is completed in August, the 70 idle ovens will be fired and supplied with coal from a new mine opening by the trestle.

**Humphreys, Stewart & Company.**—This new company has purchased 150 acres of land from the Jacob Leighty farm near Ruffsdale, and is preparing to erect 60 new coke ovens. The new plant will have connections with the South-west branch of the Pennsylvania line, siding being laid from the branch at a point just north of the Central coke plant of the H. C. Frick Coke Company.

**Standard Coke Company.**—This company, at the head of which is Isaac Taylor, is erecting 80 coke ovens of the bee-hive type near Smithfield, Fayette County, close to the coke plant of the Connellsville Coke Company at Gans. George Whetzel, formerly mine foreman at Morrell, will be superintendent of the plant. The foundation walls for the ovens are nearing completion.

**The Standard Coke Company.**—This company is making progress with its 400 new coke ovens at the Margarette plant near Trauger, in Westmoreland County. The company purchased the Oliver coal land adjoining the land of the original Standard Coke Company, and as it was necessary to go over the land of the Standard Coke Company to develop the tract the latter property was purchased, together with the 100 ovens in operation.

##### Slate.

(From Our Special Correspondent.)

**Slate Shipments.**—During June 255 carloads of roofing slate, or about 15,000 squares, were shipped from the Pen Argyl quarries, an increase of 12 carloads over June, 1898.

**Albion.**—Work of cleaning up the 15,000 cu. yds. of rubbish carried down in last week's slide progresses. William Harding & Company have 1 rope free for slate making. Their lease expires within a year, and they may not remove the debris except by agreement with the owners, the Albion Slate Company. William Lobb & Sons' quarry can be cleared within 2 months. Stephens, Jackson & Company can clear up nearly as soon. They are making slate with 1 rope. Estimates make the normal combined production 8,000 square per month, now cut down ½, a loss of about 25,000 squares for the remainder of the year, or a money loss to the companies of about \$60,000. Estimated cost of removing slide, \$10,000.

**Chrome Slate Company.**—The new lessees of the Northampton Quarry have taken this title and are pushing operations.

**Golden Rule.**—Henry Parsons retains his ¼ interest in this Pen Argyl quarry, with the firm of Parsons Brothers. A deal for a new company with Bangor operators interested fell through.

**Hower vs. West Albion Slate Company.**—The Hower Slate Company, of Danielsville, has brought suit against the West Albion Slate Company of Pen Argyl to recover \$50,000 damages for breach of contract. The plaintiff claims to have entered into an agreement with the defendant to take its entire product for a year at stipulated prices and that the defendant, after having carried out the contract until June, now refuses to continue.

**Jackson Slate Company.**—A suit in equity has begun by Thomas Jackson vs. Richard Jackson, Sr., Richard Jackson, Jr., John Jackson and Joseph Welch, trading as the Jackson Slate Company, of Pen Argyl. The plaintiff prays for a decree dissolving the existing partnership, alleging that he does not receive his equitable share of the profits; also that contracts were taken by his partners without consulting him.

**Pennsylvania Hard Vein.**—This Edelman's quarry produced 600 squares and shipped 650 squares of roofing slate in June.

##### Blair County.

A new limestone company has been organized to work quarries at Williamsburg, near Hollidaysburg. Jones & Laughlins, of Pittsburg, and J. King McLanahan, Jr., of Hollidaysburg, are interested, the latter being president of the company. The new concern intends to open up quarries, run sidings and ship large amounts of limestone.

##### Lancaster County.

**Nickel Mines.**—At the old nickel mines near Columbia a new shaft is being sunk. Over 30 men are employed.

##### SOUTH DAKOTA.

##### Custer County.

(From Our Special Correspondent.)

**Wabash Mining Company.**—John F. Sidey, general manager of the company which purchased the Carr strike on Lightning Creek, states that the vein has been stripped 200 ft., showing good values. A shaft has been sunk 20 ft. As soon as the permanency of the vein is determined reduction works will be erected.

##### Lawrence County.

(From Our Special Correspondent.)

**New Cyanide Plants.**—F. M. Wall and W. E. Bates are erecting a 20-ton cyanide plant near Ragged Top District at Maurice station. The new cyanide plant which Allen, Small and associates are building south of Ragged Top, in Calamity Gulch, is enclosed and crushing machinery from the Gates Iron Works of Chicago is being put in. With the Spearfish cyanide plant there will be a capacity for treating 100 tons of ore per day, most of which will come from the Ragged Top District.

**Belle Eldridge.**—The lessees of this mine, in Spruce Gulch, are shipping 150 tons of ore to the smelter a month.



**Detroit & Deadwood.**—The contract for sinking a 50-ft. shaft on this company's copper property on City Creek is completed. The shaft will be sunk deeper. Work is being pushed in the long tunnel.

**Golden Reward Company.**—This company is treating 12,500 tons of ore in the smelter and the chlorination works monthly. The smelter averages about 8,500 tons a month. About 100 tons of ore are going daily to the smelter from the Golden Reward mines, the Isadorah and Ruby Belle. The company is advertising for more custom ore and the smelter will be run on full time. The price for treating the ore will be raised a little.

**Grant.**—Otto Grant has begun shipping ore from his property in North Lead District. The mine is surface work entirely, the ore being quarried in blocks.

**Hardscrabble.**—The Horseshoe Company has begun shipping 2 cars daily from this mine near Terry.

**Highland Chief.**—This company has men opening up a new ore shoot traced from the Belle Eldridge.

**Homestake Mining Company.**—A large tunnel is being run from the Old Abe shaft to Terra-ville, about ¾ mile. It will be used for hauling fuel to the Terra-ville side.

**Ironsides.**—William Hall, of Cripple Creek, Colo., has bonded the old Ironsides Mine in Squaw Creek, owned by Frank Bryant, the price being \$75,000. Active development has begun.

**Manchester and Gushurst Groups.**—The second payment has been made on the bond on these groups of claims in Squaw Creek District by P. N. Hanson of Minneapolis. S. H. Bowman of Minneapolis is interested with Hanson.

**Wedge.**—Henry Schnitzel, of Lead, is taking out about 15 cars of ore per week from this mine in Bald Mountain District.

**Pennington County.**

(From Our Special Correspondent.)

**New Railroad.**—Surveyors are in the field between Rapid City and Mystic. The old Wyoming & Missouri River Railway Company party built a line over this route several years ago.

**Big Hit Mining Company.**—Everything is ready for starting up the 200-ton concentrating plant at the Bismarck Mine.

**Castle Creek Placers.**—A number of companies are working the placer ground along this creek. Some hydraulic work is being done.

**Keating Bar.**—Wisehart & Company have purchased a portion of the Keating bar, ½ mile south of Mystic, price \$5,000. Steam power runs a hydraulic pump which washes the sand and gravel into sluice boxes. The company is having success.

**North Star.**—H. B. Dibble, of Mystic, has leased the North Star Mine, in Hornblende Camp, and will erect a 10-ton Chilean Mill. This property was leased to Blank & Company of Deadwood, who run a large amount of the ore through the Montezuma Mill at Rochford. The average value is about \$7 a ton gold.

**Uncle Sam.**—The Clover Leaf Mining Company, which owns this mine on Elk Creek, is repairing 20 of the 60 stamps and is sinking the 250 ft. shaft. The water has been pumped from the lower workings, which are being retimbered.

**Wheeler Hill.**—A company of Eastern capitalists has begun a tunnel on Castle Creek above Castleton to catch a vein found by outcroppings.

**UTAH.**

(From Our Special Correspondent.)

**Bullion and Ore Shipments.**—During the week ending July 8th there were forwarded East from the different smelters of the trust 18 cars, or 725,991 lbs. lead-silver bullion, and from the different camps of the State 52 cars, or 1,866,540 lbs. lead-silver ore. On July 8th the Utah Consolidated Smelter was loading its second consignment of pig copper, which will be about 200,000 lbs. This product carries 99% copper, \$60 gold and 40 oz. silver.

**Bingham Copper Smelter.**—It is given out that the Bingham Copper-Gold Company will build a copper smelter of 250 tons capacity, practically a duplication of the Utah Consolidated plant.

**Cyanide Products.**—Consignments of products from cyanide mills, in the region tributary to Salt Lake City, for the first week in July exceed those for the corresponding week of 1898 by more than 800 lbs. Mr. George Moore succeeds Major J. E. Jackson as manager of the local office of the Consolidated Kansas City Smelting and Refining Company, where all these products are marketed.

**Beaver County.**

(From Our Special Correspondent.)

**Taylor Group.**—A bond is secured on the Taylor claims, south of Milford, by J. F. Shemwell and A. W. Bainbridge of Cripple Creek, and G. A. Holmes of Salt Lake City, for \$50,000. It is said a payment of \$5,000 was made on the signing of the papers and the balance is due in 90 days. This is a copper proposition.

**Juab County.**

(From Our Special Correspondent.)

**Tintic Shipments.**—In the week of July 8th there were forwarded from the 3 rail points of the district 147 cars of ore, 11 cars of concentrates and 5 bars of bullion. The ore is credited as follows: Grand Central, 23 cars; Mammoth, 22; Bullion-Beck, 13; Centennial-Eureka, 12; Swansea, 11; Godiva, 8; Uncle Sam & Hamburg, 7; Gemini, 5; South Swansea, 4; Four Aces, 2; Carissa, 2; Northern Spy, Sioux Consolidated, Star Consolidated and Lower Mammoth, each 1 car; Dragon Iron, 34 cars hematite for flux. Bullion-Beck shipped 8 cars of concentrates, Mammoth 13 cars concentrates and 3 bars of bullion. The record for the half year ending June 30th is 2,408 cars of ore, 159 cars concentrates and 195 bars of bullion, and for the last 3 months 1,196 cars of ore, 79 cars concentrates and 24 bars of bullion. Grand Central is credited with the largest production, 211 cars, followed by Bullion-Beck, 197, and Centennial-Eureka, 123 cars. No other mine reached 100 cars in the second quarter, with the exception of the shipments of hematite from the Dragon Iron.

**Alaska.**—On July 6th the company took up the \$10,000 bond and reorganized the directorate. The new officers are: John R. Case, Chicago, president; Fred L. Oswald, Salt Lake, vice-president; W. H. Webster, treasurer; Morris R. Hunt, secretary; who, with E. P. Jennings, constitute the board of directors. The Alaska has one of the strongest fissures of the porphyry section.

**Bullion-Beck.**—About 9,000 gals. of water are daily pumped, a great aid in operating the mill.

**Mammoth.**—President McIntyre states that the report of the mill being long idle is not true. He also says it will not be the policy of the new management to compel the men to patronize the company store and boarding house.

**Swansea.**—A station is being cut at the 850 ft. level, where a greater flow of water was tapped. The old engine was pressed into service, while the defective new one is being replaced.

**Salt Lake County.**

(From Our Special Correspondent.)

**Electric Railroad.**—It is said semi-officially that an electric road between Bingham and Salt Lake for freight and passenger service is under consideration.

**Congor.**—Handsome specimens of bornite 32% copper, form a part of the ore uncovered in this Bingham claim. In the face of the incline is a 2 ft. seam which samples \$11 copper, \$2 gold, and a carload is ready for shipment.

**Grizzly.**—A sale of this group at Alta is reported to Messrs. C. E. Loose and William Hatfield. The price is said to be \$50,000.

**New Mammoth.**—The cyaniding mill will be ready late in July. Sampling of the ore bodies by William Orr is said to have shown an average of \$7 per ton.

**Petro.**—A settlement was made July 8th on 9 cars of ore, said to have averaged 49.2% lead, with small values of silver, copper and gold.

**Summit County.**

(From Our Special Correspondent.)

**Park City Shipments.**—In the week ending July 8th the ore and concentrate products sent forward through the Mackintosh sampler aggregated 2,191,415 lbs., and were contributed as follows: Silver King, concentrates 709,800 lbs., crude 359,370 lbs.; Daly West, crude 707,935 lbs.; Ontario, crude, 414,310 lbs. The shipments for the half year ending June 30th were 42,331,722 lbs., compared with 33,637,770 lbs. for the corresponding period of 1898.

**WASHINGTON.**

**Ferry County—Republic.**

(From Our Special Correspondent.)

**Bryan & Sewell.**—The company will reorganize on an assessable basis. The shaft is 150 ft. deep. The drift at this level was driven 98 ft., but failed to cut the vein. It is supposed that a slide had faulted the vein. It is calculated that the drift will have to go 150 ft. more.

**Chico.**—A contract has been let to sink a double compartment shaft about 250 ft.

**Copper Mountain.**—This property consists of 3 claims on 1 vein and another 1 east on a parallel vein. The east vein, 25 ft. wide, carries fine looking quartz from which some good values have been obtained. The west vein is claimed to be traceable a long distance. On this property it crops out 100 ft., or thereabouts, wide. The filling is quartz, with iron and arsenical sulphides showing gold and silver values from \$2 to \$107 per ton, the principal value being in gold. There are 2 tunnels, the upper one is in 250 ft. The other, 75 ft. lower, is in 180 ft. and will strike the vein at a probable vertical depth of 250 ft. A contract has been let to drive it 300 ft. further. At 150 ft. in a vertical fissure was cut in the lower tunnel upon which a short drift was driven. A winze was sunk 100 ft. The filling of the fissure is clay, with quartz and limestone fragments. At 60 ft. down the winze struck carbonaceous slate with

layers of quartz that assay from \$2 to \$17 in gold per ton.

**Delta.**—The shaft is down 75 ft., and a drift is running north on the vein. The drift shows blue quartz, which the management reports carries values of \$80 to \$100 a ton.

**Kate Hayward.**—The tunnel struck the hanging at 200 ft. in. The vein is nearly vertical, and is 10 ft. wide. Much of the quartz is white and granulated; this kind in the Republic Mine carries high values. No values are reported.

**Northwestern Gold Mines, Limited.**—This company owns the Hannah, Blackbird, White Lode and Tillie claims, 8 miles west of the San Poil River and 35 miles southwest from Republic. A quartz ledge is traceable 4,000 ft., the croppings showing 30 to 40 ft. wide. The vein is a contact between granite and porphyry. A tunnel on the vein is in 66 ft. Samples taken from along the tunnel ran from \$8 to \$10 a ton. A contract has been let to run a 150 ft. tunnel to cut the vein at 700 or 800 ft. depth. The croppings rise boldly above the crest of the hill. There is ample water for milling. The new tunnel site is ¼ mile above the wagon road, between Napoleon and Wilbur, on the Central Washington Railway. It will cost \$5 a ton to ship to Berry Landing, on the Columbia River, and \$8 a ton to Wilbur. The company is a Republic corporation, with C. A. Greenberg, president; S. I. Spiggle, vice-president, and E. B. Stone, secretary.

**Parrott.**—This claim, showing a big quartz vein, is ¼ mile southwest from the Copper Mountain. The quartz partly is exposed 5 ft. wide, in graphitic slate. A tunnel runs 200 ft. through slate.

**Quilp.**—The middle cross-cut is in ore that assays 108.7 oz. silver and 6.44 oz. gold, with a total value of \$198 per ton. This is the highest value yet found. The vein in the north cross cut is 30 ft. wide.

**Sally Ann.**—At this claim on Taroda Creek a new tunnel has started to tap the vein at 500 ft. depth, and is in 100 ft. It will be 450 ft. long. The vein has been developed to a depth of 135 ft.

**WEST VIRGINIA.**

**Fayette County.**

(From Our Special Correspondent.)

**Longacre Colliery Company.**—This company, having recently finished 25 Welch coke ovens, is now building 25 more. The coke seems to be of very fair quality except for about 3 or 4 in. of black inferior end on the bottom. A mechanical device draws the coke from the ovens.

**Kanawha County.**

(From Our Special Correspondent.)

**Capt. W. R. Johnson, of Crescent, has begun work on a line up Blake's Branch of Smither's Creek to connect a large body of his coal land, several thousand acres, with the Kanawha & Michigan Railway.**

**WISCONSIN.**

**Iron—Gogebic Range.**

**Hennepin.**—This old mine at Pence is to be reopened; it has been idle since 1891, in which year it produced 15,750 tons. J. S. Kennedy, of Ironwood, Mich., is interested in the enterprise.

**FOREIGN MINING NEWS.**

**AFRICA.**

**Cape Colony.**

**De Beers Consolidated Mines, Limited.**—The London board has received information from Kimberley by cable that a dividend of 20s. per share (40% per annum) for the six months ending June 30th, 1899, has been declared, subject to final audit. The revenue for the financial year ending June 30th, 1899, including diamonds on hand, is £4,058,000, and the expenditure £1,614,000, leaving a gross profit of £2,444,000, and after providing for interest and sinking fund on debentures, and all other obligations, there remains a net profit of £2,134,000, out of which two dividends amounting to 40% have been declared. These figures are exclusive of the amount carried forward in the last balance sheet, and of an increase in the stock of blue ground.

**AUSTRALASIA.**

**New South Wales.**

**Broken Hill Proprietary Company.**—This company's statement for the four weeks ending June 22d shows 23,975 tons ore treated. The refinery report shows an output of 2,972 tons lead, 47 tons hard (antimonial) lead, 381,534 oz. silver and 2,100 oz. gold.

**New Zealand.**

The Mines Department reports the exports of gold and silver as follows for the four months ending April 30th, in crude ounces:

	1898.	1899.	Increase.
Gold .....	84,698	126,161	41,473
Silver .....	72,351	107,602	35,251

The exports in April were 33,343 oz. gold and 22,101 oz. silver.

## CANADA.

British Columbia—Texada Island.  
(From Our Special Correspondent.)

It is stated that John D. Rockefeller has bought iron mines on Texada Island through the Monte Cristo Mining Company, which he controls, and will erect a blast furnace at some point on Puget Sound.

British Columbia—West Kootenay District.  
(From Our Special Correspondent.)

Rosslund Ore Shipments.—For the week ending July 6th there were shipped from Rosslund mines 97 cars of ore aggregating 3,007 tons. The shipments from these mines from January 1st to July 6th amounted to 67,000 tons.

Brandon & Golden Crown.—Additional machinery has been installed at this mine in Boundary Division, and the shaft has been deepened to 200 ft. level. A drift is being run to the side line. Two Burleigh drills are running.

British America Corporation.—At the Nickel Plate the upraise from the 200 ft. level connecting with the new shaft has been completed and the shaft timbered. Sinking is going on to the 300 ft. level, where a station will be cut out and sinking will be continued to the 400 ft. The management is using the old Le Roi hoist.

Cariboo.—The management of this mine in Boundary Division reports that 20 stamps are working steadily.

Eight Hour Law.—The tendency is now toward using the contract system in most of the mining divisions where strikes have taken place.

Great Western.—The old shaft house on this Rosslund property has been removed, and a larger one is to be erected. It is the intention of the management to develop fully the ledges which show at the surface. William S. Haskins is superintendent.

Jewel.—About 1,800 ft. of work at this mine in Boundary Division has been done. This includes 248 ft. of shaft, 600 ft. of drift and 160 ft. of raises and winzes. About 500 tons of ore are on the dump, and the management reports about 10,000 tons in sight. The ore averages \$13.36 in gold and silver. The management is about to install a 50 ton cyanide plant and states the ore can be treated at \$5 per ton.

Mascot.—The Rosslund property is being developed by 2 tunnels and a winze. The winze is down 180 ft. in good ore. Tunnel No. 2 is in 750 ft. in ore the entire distance. Tunnel No. 3 is in 725 ft. A cross cut is being run to top the ledge at 500 ft. depth and connect with the winze. The cross-cut is in 70 ft., with 90 ft. to run. No. 2 ledge is developed by 3 shafts, with a total depth of 150 ft. in quartz. The plant comprises a 7 drill Ingersoll-Sergeant compressor driven by electric power furnished by the West Kootenay Power and Light Company. The Mascot is owned by eastern men. The capital stock is divided into 3,500,000 shares, par value \$1. The property is situated on Columbia & Kootenay Mountain. The values are in gold and copper. C. E. Galt of Montreal is secretary and Jay P. Graves of Spokane is manager.

Rathmullen.—This company, which owns 16 claims on the North Fork of Kettle River, has ordered a hoist, engine, sinking pumps and a complement of drills.

Volcano.—This property on the North Fork of Kettle River, noted for its massive ledges, is owned by R. A. Brown. About \$25,000 has been expended in development work. Assays taken from the surface show \$10 gold and 12% copper.

White Bear.—The management of this Rosslund camp has been completed at the 250 ft. level. The shaft is about to be deepened to the 450 ft. level. John Y. Cole is superintendent.

Ontario—Rat Portage District.

Westfield.—At this property in Manitou District, owned by the Manitou Lake Gold Mining Company, of Toronto, a 10-stamp mill is to be connected with the shaft by an aerial tramway. The shaft is down about 100 ft. A 6-drill compressor is to be ordered. N. C. Westerfield is manager.

Yukon District.

Miners are arriving at Puget Sound ports with gold direct from the spring clean-up. It is stated that the output this year will be much larger than last, and may reach \$15,000,000. Considerable gold is to come out this year that was part of last year's clean-up, and has since been stored at Dawson. On July 6th the White Pass & Yukon Railway was completed from Skagway to Lake Bennett. As a result, a San Francisco party of 3 men recently traveled from Dawson City to Seattle in 10 days.

CENTRAL AMERICA.

Nicaragua.

(From an Occasional Correspondent.)

Allen & Fulks have made their first shipment of ore from their El-Mico Mines to the Omaha & Grant Smelting Company, Denver. Their shipment was 16 sacks. It assays 12.05 oz. gold and 31.6 oz. silver. They expect soon to make another and larger shipment.

## CUBA.

Cuban Steel Ore Company.—This company has been organized in Philadelphia. According to the prospectus, it proposes to open up 2 groups of iron mines 45 miles west of Santiago de Cuba, in the Province of Santiago, and build a railroad about 10 miles long to connect the mines with the harbor of Chivirico, together with piers, docks, etc. The mines are stated to contain about 2,100 acres, and it is said that over 20,000,000 tons of ore is in sight. The ore is a high grade Bessemer.

## COAL TRADE REVIEW.

Anthracite.

New York

July 1st.

There is little to note in the Eastern seaboard anthracite trade. The midsummer quiet that prevails is not likely to be broken for at least another month. No one is trying to force coal on the market, and practically all the coal that is changing hands is on contracts made before July 1st.

At inland points and throughout the West things are much livelier; in fact, business is quite good for this season of the year. The movement of coal up the lakes from Buffalo is not very heavy; vessels are too busy hauling ore to Cleveland, Coneaut and other iron ore ports to bother with small lots of coal, and regular freighters have plenty of general merchandise to take. As a result, the movement from Buffalo in July probably will be under 300,000 tons.

Production for June was 4,024,000, or about 1,000,000 more than for the same month last year, while for the first 6 months the production was 20,648,783 tons, an increase of 4,457,470 tons over the first 6 months of 1898. Considerable of this June production went into storage. Some of the companies in the Southern anthracite fields may be anticipating a short supply of labor and consequent inability to fill orders when the fall rush of orders finally comes and are rushing collieries pretty near full time.

The report on a possible export trade in anthracite made by a representative of certain mining and transportation interests proves, as was expected, rather interesting reading. However, there are no immediate prospects of a regular line of colliers supplying anthracite to Europe, with first-class bituminous coals selling at tidewater on this side for \$1.60 a ton or less.

Quotations f. o. b. New York for free burning anthracite are unchanged as follows: Stove and nut, \$4; egg, \$3.75; broken, \$3.40.

Bituminous.

The seaboard soft coal trade continues to keep producers busy. The Clearfield strike has finally collapsed, and there are small chances of further labor troubles this season, except isolated cases. The movement of coal to points beyond Cape Cod continues very heavy. Vessels are in short supply, and ocean freight rates have hardened perceptibly. Long Island Sound demand remains good, as does all line trade. There is a great demand for vessels from the lower Chesapeake Bay ports.

The recently announced alliance between New York Central and Pennsylvania means, for one thing, that both roads are going to get more money out of their soft coal traffic than hitherto.

Transportation from mines to tide is decidedly good, but producers still complain that car supply is insufficient.

In the coastwise vessel market freight rates are strong. One peculiar thing noted just now is the difference between Philadelphia rates and those from the further lower ports. We quote current rates from Philadelphia as follows: Providence, New Bedford and the Sound, 70@75c.; Boston and Portland, 80@85c.; Salem and Portsmouth, 85@90c.; Lynn and Bangor, 90@95c.; Saco, 95c.@\$1; Gardner, 95c. and towages; Dover, \$1.10 and towages. As much as 20c. above these figures is reported on rates from Norfolk.

Quotations are unchanged at \$1.60@1.65 for best grades at Philadelphia and the further lower ports, with 10c. extra for prompt deliveries.

Birmingham Ala.

July 10.

(From Our Special Correspondent.)

While the output of coal in the State is quite large now, there is a slight decrease to be noted, caused by some of the mines which sell their product to the domestic trade altogether working on part time. The miners made a contract with a number of operators in this district with coal mining at 45c. per ton, on a sliding basis, and when iron goes up mining goes up. The operators of the mines whose output is not used for iron making complain that they cannot afford to pay the advancing prices for mining, and hence have found it cheaper to shut down their mines than to keep them going with the high price paid the miners. The indications are that the mines will run all through the summer now. The Walker County mines are getting rid of their product just as quickly as they can get it out, and are not competing with the mines in Jefferson County.

State Mine Inspector DeB. Hooper says that

all indications point to a larger output for the first half of the year 1899 than for the first half of last year.

The United Mine Workers of America are gaining more members in Alabama every week. President George Young, of the Alabama District No. 20, of that organization, is doing considerable traveling about among the various collieries and is organizing the men.

Chicago.

July 12.

(From Our Special Correspondent.)

Anthracite Coal.—The demand for hard coal is only moderate, buying being mainly in small quantities or just enough for actual present requirements; a couple of car-loads at the most for out of town dealers represents the largest purchases, while a car-load is the usual requirement. The advance in the circular price of 25c. per ton has depressed sales, but this is midsummer, when there is always light buying, and it may be that dealers will soon take advantage of the present prices and buy. The possibility of another increase in the price of hard coal is not at all unlikely, and like other commodities, coal may do a little ballooning. Circular continues at \$5 for grate, and \$5.25 for domestic sizes.

Bituminous coal continues in big demand from manufacturing and other industries. There is some diminution in soft coal supply, but as yet there is an over-production, which has been the means of breaking the prices. The anxiety of the mines to send coal to Chicago has weakened the market greatly, and purchasers of soft coal to-day are accordingly reaping the benefits in low prices.

Coke continues in fine demand, with prices steady.

Pittsburg.

July 12.

(From Our Special Correspondent.)

Coal.—The railroad coal mines are all being operated to their fullest capacity in the Pittsburg District. Some operators are complaining of a scarcity of railroad cars, and others are trying to secure more diggers. There has been a great scarcity of coal miners in this field. It is predicted that this will be one of the most prosperous seasons in the coal business in many years, and shippers to the Northwest say the tonnage this season will exceed that of last year by about 1,500,000 tons. The shipment by lake last year was 4,500,000 tons, and this year will reach 6,000,000 tons. Many of the river coal mines are idle just now on account of low water. There is an unusual quantity of coal loaded and ready for shipment to Southern ports, but it will not get out until the next rise in the river.

The Monongahela Coal and Coke Company, the combination of the river coal interests, is almost ready for business. The proposed combination of the railroad coal interests is progressing favorably. The only hitch that has occurred so far is a dispute between some of the mine owners and the appraisers as to the valuation of the properties. These differences are expected to be settled in a week or two.

Connellsville Coke.—Every plant in the Connellsville Region that is in good condition is in operation this week for the first time in five years. The demand for coke is unusually heavy, and ovens are being put in blast as soon as needed repairs can be made. The Empire Coke Company has just been formed, and will apply for a charter soon. The company is negotiating for a large tract of land in the Connellsville Region, on which it is proposed to erect about 500 ovens as soon as possible.

The shipments last week aggregated 10,021 cars, distributed as follows: To Pittsburg and river tipples, 3,238 cars; to points west of Pittsburg, 5,064 cars; to points east of Connellsville, 1,719 cars. This is an increase of 31 cars compared with the shipments of the week previous.

San Francisco.

July 8.

(From Our Special Correspondent.)

Coal receipts at San Francisco by water in June were 135,243 tons, a decrease of 12,069 tons from June, 1898. For the six months ending June 30th the receipts were as follows: Eastern, anthracite and Cumberland, 17,986; Washington, 313,273; Oregon, 29,310; British Columbia, 231,098; Australia, 78,610; Japan, 6,350; Great Britain, 36,949; total, 713,576 tons, showing an increase of 21,960 tons, or 3.2%, over last year.

The statement does not include coal from the Monte Diablo and other California mines, nor receipts from Wyoming mines by rail.

Two cargoes from Japan were received in June, the first noted at this port for about two years. There has been a decrease in the receipts from British Columbia this year, but this has been more than made up by a large increase in Washington coal.

## SLATE TRADE REVIEW.

New York.

July 14.

Demand exceeds the supply, and prices in consequence are firmly held. We understand exporters are experiencing much difficulty in securing the necessary slate to fill their orders,



notwithstanding the contracts with other quarries for part or all of their annual production. In one instance a suit has been brought by an exporter against a quarry in Pennsylvania for non-compliance with their agreement. It is claimed that this quarry has violated its contract by selling slate to another party at a somewhat higher price than is stipulated in its contract with the exporter. On the other hand, the quarries are confronted with greatly increased expenses from higher costs of labor and supplies. Therefore the six or twelve-month contracts booked by them at last year's prices are now netting them little or no profit.

In the home market roofers are ordering more freely, but deliveries are slow. The shipments of roofing slate from Pennsylvania in June were about 29% less than the previous month. School slates, however, show an increase of 61%, and blackboards 7%, as compared with May. For the six months ending June 30th we estimate the total shipments from Slatington, Walnutport and Danielsville, as follows: Roofing slate, 118,000 squares; school, 7,000 cases, and blackboards, 8,000 crates. At the present rate the shipments of roofing slate from Slatington and Walnutport will amount this year to fully 42,000 squares more than in 1898, and 55,000 squares more than 1897. School slates and blackboards, on the other hand, would show a decrease, but as the next three or four months usually make up the active season for this industry the shipments are likely to increase. We note also that Danielsville has shipped since January 1st about 1,500 crates, 2,200 pieces and several cars of flagging. For the first week in July the shipments were: Slatington, 4,213 squares roofing slate; 507 cases school slates, and 361 crates blackboards; Walnutport, 186 squares roofing; Danielsville, 250 squares roofing, one car and 107 crates blackboards, and 183 crates flagging.

The export movement from New York continues on a limited scale, owing to the lack of slate at quarries. Last month some fairly large shipments of roofing slate were made to Australia, while Great Britain held first place.

Freight rates from New York are about as follows: To London, 12s. 6d. (\$3), or about 86c. per square roofing slate; Liverpool, 12s. 6d.; Manchester, Bristol, Leith and Glasgow, 15s. (\$3.60), or \$1 per square; Hamburg, 12s. 6d. prompt, and 15s. near future; Copenhagen, 16s. 3d. (\$3.90), or \$1.11 per square; Newcastle and Hull, 17s. 6d. (\$4.08), or \$1.17 per square; Denmark, Stettin, 17s. 6d., all with a 5% primage per ton weight. To Bremen the rate is 15s. net (\$3.60), or \$1 per square. To Sydney, New South Wales, 15s. net is asked for roofing slate in cases or in bulk.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries is given below:

Prices of Roofing Slate.

Size, inches	Monson or Br'nville	Bangor	Bangor Ribbon	Alb'n or Jackson Bangor	Lehigh	Peach Bottom	Sea Gr'n	Unfaded Green	Red
24 x 14	6.10	3.50	3.00	3.35	3.40	4.85	3.00	.....	.....
24 x 12	6.00	3.50	3.00	3.35	3.40	5.00	3.00	3.75	.....
22 x 12	6.00	3.50	3.25	3.50	.....	5.00	3.00	3.75	.....
22 x 11	6.50	3.75	3.25	3.50	3.40	5.00	3.00	4.00	.....
20 x 12	6.90	3.75	.....	3.50	3.40	5.00	3.00	3.75	.....
20 x 11	6.80	.....	4.00	.....	.....	5.00	3.00	.....	.....
20 x 10	6.80	4.50	3.50	4.00	3.75	5.10	3.25	4.25	9@10 1/4
18 x 12	6.80	3.75	.....	3.50	.....	3.00	3.50	.....	.....
18 x 11	7.00	.....	.....	.....	.....	3.00	3.75	.....	.....
18 x 10	7.20	4.50	3.50	4.00	3.75	5.00	4.00	4.00	9@10 1/4
18 x 9	7.10	4.50	3.50	4.00	3.75	5.10	3.00	4.25	9@10 1/4
16 x 12	6.80	3.75	.....	3.50	.....	2.85	3.50	.....	.....
16 x 10	7.10	4.25	3.50	4.00	3.75	5.00	2.85	4.00	9@10 1/4
16 x 9	7.00	4.25	.....	4.00	3.75	5.10	2.85	4.25	9@10 1/4
16 x 8	7.20	4.50	3.50	4.00	3.75	5.10	2.85	4.25	9@10 1/4
14 x 10	6.60	3.75	3.25	3.35	.....	5.00	2.75	3.75	9@10 1/4
14 x 9	6.50	.....	.....	.....	.....	2.75	3.75	.....	9@10 1/4
14 x 8	6.60	3.75	3.25	3.35	3.40	4.85	2.75	4.25	9@10 1/4
14 x 7	6.40	3.75	3.25	3.35	3.40	4.85	2.50	4.25	9@10 1/4
12 x 10	5.80	.....	.....	.....	.....	2.50	3.25	.....	.....
12 x 9	5.60	.....	.....	.....	.....	2.50	3.25	.....	.....
12 x 8	5.50	3.50	.....	3.35	3.25	4.00	2.50	3.50	8 1/2@9
12 x 7	5.00	3.25	.....	3.35	3.25	4.00	2.50	3.50	8 1/2@9
12 x 6	4.80	3.25	.....	3.35	3.25	4.50	.....	3.50	8 1/2@9

A square of slate is 100 sq. ft. as laid on the roof.

In Brownville and Monson delivery quotations can be had somewhat lower than above, which is also true of other brands. No. 1 Bangor are 50c. extra when full 3-16 in. thick, and Peach Bottom 25c. extra per square. Intermediate sea green, \$2.25@2.45 per square, according to size.

CHEMICALS AND MINERALS

(For further prices of chemicals, minerals and rare elements, see page 90.)

New York. July 14.

Heavy Chemicals.—Market in nearly all lines is quiet, with prices unchanged. Chlorate of potash, however, is higher, owing to limited offerings. As regards foreign chlorate of potash, it is estimated that the consumption in this country from January 1st to June 1st amounted to about 354,000 lbs., showing a decrease of 1,724,011

lbs., or 83%, as compared with last year. This falling off is largely due to the increased production in America, especially in the Middle West.

Imports this week included 354 bbls. and 118 casks bleaching powder. For the 27 weeks ending July 7th the imports of soda ash at New York fell off nearly 50%, as compared with the corresponding period last year; sal soda decreased 24%, while bicarb. soda showed an increase of 77% over 1898. Receipts of domestic goods at this port this week included 840 sacks, 280 kegs, 256 bbls., 191 boxes and 282 drums soda ash.

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York	In New York.
Alkali in bags.	67 1/2@70c.	80@85c.	80@85c.
Caustic Soda, high test	\$1.55@1.65	\$1.60@1.65	\$1.60@1.70
88% powd.	.....	2.75@3.00	.....
60@74% powd.	.....	2. 2/4@2.25	.....
" conc.	70c.	.....	62 1/2@70
Bicarb Soda.	1.00@1.35	.....	1.60@1.65
" extra	1.12 1/2@1.25	.....	2.12 1/2@2.25
Bleach. Pdr., Eng. prime.	3.25@3.50	.....	1.42 1/2@1.50
other br'nds.	.....	.....	1.25@1.35
Chl. Pot. Cryst. powd.	.....	9.25@9.50	9.50@9.75
.....	.....	10.00@10.25	10.25@10.50

Prices are generally for large quantities, and in many cases depend upon make, test and package.

Acids.—Market is unchanged. Imports of oxalic acid at this port this week were only 50 casks. Blue vitriol export trade is quiet.

Quotations are in large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, com. No 8.	\$1.50	Nitric, 38°	\$3.75@3.80
Blue Vitriol, best	5.25	Nitric, 40°	4.0@4.05
Chamber, 50° ton.	11.50@12.00	Nitric, 42°	4.62@4.65
Muriatic, 18°	1.10@1.15	Oxalic	6.25
Muriatic, 20°	1.20@1.25	Sulphuric, 66°	1.10@1.15
Muriatic, 22°	1.35@1.40	Sulphurous, 100°	.....
Nitric, 36°	3.50@3.55	SO <sub>2</sub> anhydrous.	8.00@10.00

Brimstone.—Arrivals were 1,000 tons. Prices easier. Spot best unmixed seconds, \$21 1/4@21 1/2; futures, \$20 1/2@20 3/4 per ton. Thirds, about \$2 less per ton.

Pyrites.—Demand just now exceeds the supply. A number of furnaces burning pyrites in the South have been blown out because the necessary ore could not be obtained. Cable advices state with regard to the business abroad that freight rates have advanced 3s. and that the shipping facilities at Huelva are inadequate for the increased trade. The chemical and fertilizer works of Germany, Belgium, Switzerland and France have been enlarged from 30 to 100% within the last 18 months. England is also increasing its works. Therefore the demand for pyrites is unprecedented, and selling prices within the past few months have advanced from 20@25%. We note five British steamers have recently been chartered abroad to carry pyrites from Huelva to this country. These are: To Galveston, at 12s., July sailing; Philadelphia (1,931 tons and 1,331 tons capacity), at 10s.; Pennsylvania (3,000 tons dead weight), at 10s., July sailing, and to Savannah (1,361 tons), at 10s. 6d. Imports this week were 2,750 tons copper pyrites from Tilt Cove, and 2,980 tons iron pyrites from Huelva, Spain. We quote American pyrites as follows: Mineral City, Va., lump ores, \$3.25 per long ton (basis 42%), and fines, \$3; Charleston, Mass., lump, \$5.50, and fines, \$4.75; Pilley's Island, lump, \$6.50, and fine, \$4.50 per long ton, delivered in New York. Spanish pyrites, 12@14c. per unit, according to percentage of sulphur contents delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46% to 51% sulphur, the American from 42% to 44%, and Pilley's Island, N. F., 50%.

Fertilizing Chemicals.—Demand is quiet. Sulphate of ammonia and dried blood are easier. Swift & Co.'s plant, near Atlanta, Ga., will be used for distributing their Western tankage. Imports this week were 3,500 bags muriate of potash. Potash salts are featureless.

Articles.	F. o. b. Wks.	In N. Y.
Potash, muriate, 80@85% 100 lbs.	.....	\$1.78
" " 95% "	.....	1.81
" sulphate, 90% "	.....	1.98 1/4
" " 95% "	.....	2.10 1/4
" d'ble m're salt, 48@51% 100lbs.	.....	66c.
" " 30% "	.....	89c.
" kainit, 12.4% long ton.	.....	8.70@8.95
..... sylvanit. per unit.	.....	57@38c.
Sulph. Am. gas (25%) 100 lbs.	.....	3.10
" bone	.....	2.90
Blood, dried, h-gr. Chl. per unit	\$1.80@1.82 1/4	.....
" " N.Y.	.....	1.85@1.90
Azotine	.....	1.85@1.95
Bone black, dis., 17@18% ton	.....	16.00@16.50
Fish scrap, acid	10.50@11.00	12.50
" " dried	19.50@20	21.50
Tankage h. gr. Chicago	17@17.50	21.00
" concentrated. unit.	1.60@1.65	1.90@1.95
" bone. ton.	.....	20.00@21.00
Bone, ground	.....	23.50@25.00

The quotations on potash are on the basis of foreign invoice weights, tares and analysis, in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts.

Nitrate of Soda.—Market continues firm at \$1.62 1/2 per 100 lbs., although early in the week sales to the fertilizer trade were reported at \$1.60. Futures are nominally \$1.62 1/2@1.65. The shipments to America are estimated at 9,000 tons, or 5,000 tons less than last year. For the six months ending June 30th the shipments to this country were about 10,000 tons less than last year. The loadings on July 1st were 7,500 tons, or 3,500 tons more than July 1st, 1898.

Messrs. Mortimer & Wisner, in their monthly statement of nitrate of soda, dated New York, July 1st, give the following information:

	1899.	1898.	1897.
	Bags.	Bags.	Bags.
Imp. into Atlantic ports from West Coast S. A., from Jan. 1 to date.	330,716	402,101	255,103
Imp. from Jan. 1 from Europe	.....	55,171	.....
	330,716	457,272	255,103
Stock in store and afloat July 1, in New York.	26,449	56,610	98,973
Boston	.....	.....	2,000
Philadelphia	.....	.....	.....
Baltimore	400	.....	3,700
Norfolk, Va.	.....	.....	.....
Charleston	.....	.....	.....
To arrive, due Oct. 15, 1899.	275,000	310,000	186,000
Vis. supply to Oct. 15, 1899	301,849	366,610	290,673
Stock on hand Jan. 1, 1899.	58,406	15,383	123,593
Deliveries past month	49,757	74,896	38,443
Deliveries from Jan. 1	362,273	416,045	274,023
Total yearly deliveries	.....	967,525	710,971
Prices current, July 1	1.65c.	1.70c.	1.70c.

Salt-petre.—Market very quiet. Spot crude, \$3.40@3.50 per 100 lbs., and refined, \$4@5.25. Arrivals in June were 12,556 bags, against 5,992 bags last year. Consumption in June amounted to 8,003 bags, against 4,210 bags in 1898. For the six months ending June 30th the consumption aggregated 30,018 bags, against 38,879 bags last year. Stocks on July 1st, 1899, were 12,109 bags, against 5,080 bags at the same time last year.

Phosphates.—Buying continues good, especially for export. A charter was recently taken of a British steamer of 1,390 tons from Tampa to Helsingborg at 19s., sailing July 25th. We imported this week 2,000 bags of phosphates from Belgium.

The total shipments of Florida high-grade rock from all ports in June are reported by Messrs. Auchincloss Brothers at 23,051 long tons, all foreign. For the six months ending June 30th the shipments aggregated 234,877 long tons, against 158,795 tons in the corresponding period last year, and 181,995 tons in 1897. The distribution for the six months of the present year was as follows, the figures in parenthesis being for 1898: United Kingdom ports, 23,597 long tons (18,502 tons); Baltic, 70,410 tons (41,151 tons); Continental, 132,663 tons (87,921 tons); Mediterranean, 2,534 tons (8,579 tons); United States, 2,423 tons (935 tons); Australia and Japan, 3,250 tons (1,707 tons).

The properties and plants of the Constantine Phosphate Company, Limited, in Algeria, have been bought by the French syndicate which controls La Societe Francaise des Phosphates de Toqueville and La Societe des Phosphates de Tebessa. The purchase price is believed to be about \$750,000.

Latest quotations for American phosphates, delivered, c. i. f., United Kingdom or North Sea ports, are as follows, per unit: Florida, high-grade rock, 77@80%, 9 1/4 d., all positions (about \$14 per long ton); Florida, land pebble, 68@73%, 8d. (about \$11.20 per ton); Florida, Peace River, 58@63%, 7 1/2 d. (\$9 per ton); Tennessee, 78@80%, 8d. (\$12.64 per ton), while Algerian, 63@70%, is quoted 7 1/4 d. (\$9.38 per ton), and 58@63%, 6 1/2 d. (\$7.80 per long ton).

We quote: Florida high grade, 75@80% rock, \$10 per long ton f. o. b. Fernandina. The freight rate to New York is about \$2 per ton. Florida land pebble, 68@73%, quoted at \$7@7.50 per ton delivered in New York. Florida Peace River rock, 58@63%, \$4.50 per ton f. o. b. Punta Gorda. South Carolina ground rock, \$6 per short ton, delivered in New York; sun dried, \$3 per 2,240 lbs. f. o. b. Ashley River; hot-air dried, \$3.25 f. o. b. same place, and \$4.25@4.50 f. o. b. Charleston, S. C. Tennessee phosphate rock, \$3.50@4 f. o. b. mines for export, guaranteed 78% bone phosphate of lime and 3@4% iron and alumina (ex-vessel New York \$9@10), and \$3@3.50 for domestic brown, and \$1.90@2 f. o. b. for blue or Hickman County rock. Domestic Tennessee rock averages 75%, while for export it runs as high as 83% bone phosphate. The difference in the price of this phosphate and Florida high grade is owing to the higher percentage of iron and alumina in the Tennessee rock. Concentrated phosphates, 13@15% av. P<sub>2</sub>O<sub>5</sub>, 60@62 1/2 c. per unit at sellers' works. Acid phosphates, 60c. per unit at sellers' works in bulk.

London, England. June 30.  
(Special Report of W. Montgomery & Co.)

Nitrate of soda.—Throughout May and June the consumptive demand continued liberal, and has been no more than met by arrivals; the total stock in European ports to-day amounting to 45,000 tons, of which 28,000 tons is in ships' holds just arrived, and 17,000 tons in warehouses. This is a very small quantity, but is in great measure corrected by a comparatively large supply afloat, which amounts to 290,000 tons, as compared with 168,000 tons at same date last year. Stocks in Chile are less by 90,000 tons than 12 months ago. Deliveries in Europe during the past season amounted to 836,000 tons, of which 747,000 tons was for the Continent and 89,000 tons for the United Kingdom, an increase over the figures for the same period of 1898 of 12% for the former and a decrease of 4% for the latter. Weather conditions have been generally favorable for consumption, yet the agricultural season in Europe has proved a late one. All other nitrogenous articles have been comparatively high in price, sulphate of ammonia especially so, the supply of this being now much short of consumptive requirements. The outlook for consumption at current prices is favorable, all other kindred fertilizers being very much higher in price than nitrate of soda. The consumption of the world for the past three years, ending June 30th, has been as follows, in tons of 2,240 lbs.:

	1897.	1898.	1899.
Continent of Europe.....	824,000	904,500	981,000
United Kingdom .....	100,000	132,500	121,000
United States .....	100,000	125,000	133,000
Other countries .....	10,000	16,000	25,000
Totals .....	1,034,000	1,178,000	1,260,000
Shipments .....	972,000	1,141,000	1,373,000

For the year ending June 30th, 1899, we reckon upon a total requirement for the world at prices from 7s. 6d. @ 8s. per cent., of not less than 1,300,000 tons. The visible quantity available for consumption in Europe and America from now to October amounts to 370,000 tons, leaving 930,000 tons to be brought to consuming markets between October and June next. Prices realized by producers during the past 18 months have generally been poor. Several attempts have been made recently to form a fresh or partial combination, but without success.

Refined quality has been in steady demand throughout the past 12 months at prices generally 2d. to 3d. per cwt. over those of ordinary quality, excepting in the spring months, when the premium temporarily disappeared.

### IRON MARKET REVIEW.

#### NEW YORK, July 14, 1899 Pig Iron Production and Furnaces in Blast

Fuel used	Week ending			From		
	July 15, 1898	July 14, 1899	From Jan., '98	From Jan., '99	From Jan., '99	From Jan., '99
An'racite	F'ces. 24	Tons 19,229	F'ces. 40	Tons 35,350	F'ces. 573,667	Tons 824,249
Coke.....	142	22,230	164	223,150	5,571,891	5,891,225
Charcoal.	19	6,657	29	6,250	160,317	145,908
Totals..	185	248,086	224	264,750	6,405,875	6,861,402

Very little change is apparent in the iron market, though the week has been rather quiet as compared with the recent excitement. Demand continues for raw material, though it is not quite as pressing as it was a short time ago. Prices continue very firm, and even a shade better, as is shown by sales reported of Bessemer pig at Pittsburg for \$20.75, and No. 1 Alabama foundry at Birmingham at \$15.50. These are extreme cases, but it is hard to say how long they will be extreme. Steel billets are more irregular, and prices seem to depend a good deal upon the necessities of the buyer.

Naturally the makers of finished iron and steel are basing their prices on the higher values of raw material. Thus all structural material has been put up \$5 a ton, and increases have been made in many other finished products.

The railroads are asking their share in the increase also. We recently noted the adoption of higher tariffs on Southern pig iron; and a general increase in freight rates on iron and steel out of Pittsburg has now been made by the railroads interested.

So far the higher prices seem to have interfered very little with the demand for iron and steel. It must be remembered, however, that at the beginning of the year there were a good many contracts for material at low prices, deliveries on which have been going on ever since. These contracts are now filled for the most part, and from this on the material taken must be at the higher range now prevailing. The test of the effect of higher cost on new projects is now being made. So far it does not seem to have been very great. People are much more willing to pay high prices in boom times as a rule than they are to pay low ones in a period of depression. The man who does all his buying at low water gets rich; but he has few imitators.

The labor troubles in the Shenango Valley, which caused the banking of fires at several large blast furnaces, seem to have been settled.

The representatives of the Amalgamated Association have arranged a compromise scale with the American Tinplate Company, and work will probably be resumed in that company's mills at an early date.

Export inquiries continue active, and there seems to be a disposition on the part of foreign buyers to take iron and steel notwithstanding the higher prices. Material is needed abroad and must be had, even if the prices are high. Several contracts are reported for Alabama pig for export in the last quarter of the year.

Birmingham, Ala. July 10.

(From Our Special Correspondent.)

Purchases for export purposes seem to have been the principal item of interest in the pig iron market in this district during the past week. There was quite a number of orders booked in the last six days for iron, the most of which will go to foreign countries, and the furnace men seem willing to accept them. This iron will not be shipped right away, but will go along slowly, delivery to be made probably within four or six months. The quotations are steady and firm and have an upward tendency. There are rumors heard here that \$15.50 is being asked for No. 1 foundry, with \$15 for No. 2 foundry. When this was mentioned in offices of the larger furnace companies here, the statement was made that it is probable that such a price was quoted and paid by some purchaser of a carload lot, 30 to 50 tons, but as a general market price it could not be corroborated. A local foundryman, who buys in 100 ton lots, stated the last of the week that he was making inquiries for iron and was given to understand that No. 2 foundry would be about \$15, and No. 1 foundry \$15.50.

The following are the quotations given: No. 1 foundry, \$14.50@15.50; No. 2 foundry, \$14@15; No. 3 foundry, \$13@13.75; No. 4 foundry, \$12.50@13.25; gray forge, \$11.50@12.50; No. 1 soft, \$14.50@15.50; No. 2 soft, \$14@15.

The finished iron market is holding its own. The mills here and at Gate City are in full blast again and there is much iron being shipped from these places. The Republic Iron and Steel Company is now in full possession of both plants, the Birmingham mills just being formally transferred. There are indications that the product of the mills in this district will find a ready sale as long as the pig iron market is active. There is much structural iron demanded, while other stuff is finding a ready sale.

The foundries, machine shops and brass foundries in the Birmingham district are still as busy as they can be. There is much demand for railroad brasses, and that class of work is being handled extensively hereabouts now. The various car works in the South have an abundance of orders on hand.

The Ensley steel mill is being finished rapidly. The intention was to have it completed in August and in full operation in September, but it is believed that this cannot be done, inasmuch as the contractors are slow in supplying the machinery and other parts of their contracts. As stated by Mr. Baxter, of the Tennessee Company, when the steel mill contracts were let prices were pretty low. To duplicate the mill being constructed at Ensley it would take at least \$1,000,000 more. Already orders have been taken for a large amount of steel, delivery promised within the next 60 days. It will push the contractors at the mill to complete the big plant in the time named.

No new consolidations have been noted during the past week. The big consolidation reported last week, wherein the furnaces at Ironton and Cadsden and the mining properties of the Standard Coal Company at Brookwood, with other properties, are interested, is being arranged in full now and the new company will shortly assume full control.

Buffalo, N. Y. July 11.

(Special Report of Rogers, Brown & Co.)

There seems to be more inclination on the part of the larger consumers to take hold for next year's delivery. Several sales have been made this week for shipment during the first half of the year. One furnace interest reports having more iron sold for that delivery than ever before at this time of the year. Prices remain firm on the basis quoted below, cash f. o. b. cars at Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$20@21; No. 2 strong foundry coke iron, Lake Superior ore, \$19@20; Ohio strong softener No. 1, \$19.50@20; Ohio strong softener No. 2, \$19@19.50; Jackson County silvery No. 1, \$24; Southern soft No. 1, \$20; Southern soft No. 2, \$19.50; Lake Superior charcoal, \$22; coke malleable, \$21.

Chicago. July 12.

(From Our Special Correspondent.)

Pig Iron.—The buying of pig iron continues to be chiefly in small lots, with a larger contract thrown in here and there. The week has not been so active as the preceding one, and buyers are settling down gradually to placing orders for just enough for actual requirements, the uncertainty in prices preventing many from contracting ahead to any extent. Southern iron has been in good demand at steady prices. The Calumet Furnace is now in blast, and will soon

be a factor in the market. It is understood that the Illinois Steel Company will build a couple more furnaces at the South Chicago plant. Quotations are as follows: Lake Superior Charcoal, \$20.50@23; Local Coke Foundry No. 1, \$19@19.50; No. 2, \$18.50@19; No. 3, \$18@18.50; Local Scotch Foundry No. 1, \$19@19.50; No. 2, \$18.50@19; No. 3, \$18@18.50; Southern Coke No. 1, \$18.50@19; No. 2, \$18@18.50; No. 3, \$17.50@18; Southern No. 1 Soft, \$18.50@19; No. 2 Soft, \$18@18.50; Southern Silveries, \$18@18.25; Jackson County Silveries, \$22.50@23; Malleable Bessemer, \$20@20.50; Coke Bessemer, \$20@20.50.

Bar Iron.—There continues a brisk demand for bars, many small orders amounting up to a good aggregate. Most of the mills are full enough to keep them in operation all summer and into the fall with plenty of prospect of further operation insured. Prices continue firm, and are:—Common iron, 1.80@1.90c.; steel bars, 2c.

Old Material.—Old rails are in active demand, old steel rails being sought for at higher prices. Small sales are made from week to week at excellent prices, though the market is bare of a number of articles. Prices are:—Old iron rails, gross, \$18; old steel rails, long, gross, \$15; old steel rails, mixed, \$14.25@14.50; railroad forge, net, \$15.50@16.50; dealer's forge, net, \$12@12.50; No. 1 mill, net, \$8.75@9.25; heavy cast, net, \$11@11.50; malleable cast, ret, \$8@8.50; old car wheels, \$16; axles, net, \$18@19; cast borings, net, \$6@6.50; wrought turnings, net, \$7.50@8; axle turnings, net, \$8.25@8.75; mixed steel \$11.

Cleveland, O. July 12.

(From Our Special Correspondent.)

Iron Ore.—The general condition of the ore market is much the same as reported a week ago. Few sales were made and in fact few were possible, on account of the closely sold-up condition of the estimated production. It will be some weeks yet before agents of the mining companies will know whether or not it will be safe to offer any fair amounts for further sale. The market therefore continues quiet so far as sales are concerned. Ore is being rushed down the Lakes as rapidly as possible. Efforts in this direction have been encouraged by slightly reduced carrying rates, the price which is now being paid for cargoes from the head of Lake Superior being 90c. instead of \$1. From Marquette the price is 80c. and from Escanaba 75c.

The quotations are as follows: Specular a-d magnetic ores, Bessemer quality, \$4@4.25; specular and magnetic ores, non-Bessemer, \$3.25@3.75; red hematite ores, Bessemer quality, \$3.75@4.25; red hematite ores, non-Bessemer quality, \$2.75@3.25.

Pig Iron.—Another general advance in the price of pig iron has taken place within the last few days. As high as \$20.50 has been offered for Lake Superior charcoal, which is away above any figures yet given, while a number of sales at \$19.50 for No. 2 foundry were actually made. The demand is very strong all along the line of nearly every kind or quality. Production is being pushed to full capacity, but the output of all furnaces only a little more than equals the actual consumptive inquiry. Large amounts continue to be consumed and the market is very firm at the advanced quotations. The following are the quotations for pig iron f. o. b. Cleveland: Lake Superior charcoal, \$20.50; Bessemer, \$20; No. 1 foundry, \$20; No. 2 foundry, \$19.50; No. 1 Ohio Scotch, \$20; No. 2, \$19.50; gray forge, \$18.

Pittsburg. July 12.

(From Our Special Correspondent.)

The summer shut down in the iron and steel mills has been of minimum duration, but even as it is there is increased pressure from consuming interests for finished material. The finishing mills generally have shut down only for a day or two, and have run as steadily as supplies of steel would permit. The scarcity of pig iron has increased, notwithstanding a number of steel mills have lost considerable time since the first of the month, and have used so much less Bessemer pig. The labor trouble at Sharpville has just been settled, and the six furnaces which had been banked are being started in operation Wednesday of this week. The loss in production since the first of the month has amounted to over 15,000 tons. These furnaces were all running on Bessemer iron, which was sold to Pittsburg steel mills and one at Youngstown, O. The Pittsburg steel mills have run steadily since the first of the month, but the New Castle mill is still off, and will not resume until next Monday. At Mingo Junction and Bellaire the mills lost the first week in July, and are unable to secure sufficient pig to get the full output this week. At Youngstown operations have been considerably interfered with on account of the shortage in pig iron.

It is not likely that any relief will come in the situation before the end of the third quarter of the year, by which time it is probable supplies of pig iron will be better, and steel mills will be able to make their full output, while the pressing demand for finished material will naturally begin to ease off a trifle. The first of Laughlin & Company's new furnaces at Pittsburg will probably be in blast before the end of September, as will the two new furnaces at Lorain. These three furnaces will have a com-



bined output of 54,000 tons of Bessemer pig iron a month. The furnaces being built at Youngstown are not likely to be put in operation before the first of next year.

During the week crude materials have further strengthened in price, not so much from an active demand as from the fact that producers have been unable to keep up with deliveries, and in consequence do not find that they are likely to have any material to sell, perhaps for the balance of the year. In finished lines prices have fully maintained their high level, and in some cases they have been advanced. It is now generally believed in the iron trade that the second half of the year will see higher prices than the first half, while, of course, the average will be much higher.

Steel Billets.—There is practically no steel to be had from steel mills, and the market is quiet, there being little present demand. Steel mills are making every effort to furnish the material they have sold, but all are behind on deliveries. There is some steel to be had from middlemen, but the quantity is limited. The market is quoted at \$33.50@34, delivered at Pittsburg.

Structural Material.—Last week the associated producers advanced prices all along the line by \$5 a ton, or a quarter of a cent a pound. The demand is of the usual running variety, practically all the large contracts for the season having been placed in the spring, at prices considerably lower than the present.

Ferro-Manganese.—Ferro is decidedly scarce, but prices remain unchanged. Domestic 80% ferro-manganese is quoted at \$85 for large lots, and higher prices for smaller quantities.

Bars.—Both steel and iron bars are very firm. The strike at the works of the leading local producer of steel bars is being broken, and production is increasing. Steel bars are quoted at 2@2.25c. and iron bars at about \$1 a ton lower.

Pig Iron.—Nearly all grades of pig iron are firm. Bessemer is very scarce, and but little is to be had for the balance of the year. There is some little selling for the first quarter of next year. We quote \$20 Valley furnace, or \$20.75 Pittsburg. In mill iron there is a decided scarcity, and sales have been made at Pittsburg as high as \$17.50. In foundry iron there is a very small demand, but the supply is also very small, and fancy prices have to be paid for what material is secured. We note sales of No. 2 foundry iron at \$18 and even as high as \$19.25.

There is no change to note in the pipe and tube market. The new company which is to control nearly all the plants has taken formal possession, but no change in the selling offices or policy has yet been made.

In wire and wire nails the market is very firm. Wire nails are still quoted at \$2.45@2.50.

The scrap market is very irregular. Nearly all lines of scrap material are decidedly scarce and prices are unquotable.

**New York, July 14th.**

There is little change in the market. Domestic buying is generally in small orders, which, all told, make up a very respectable total. In foreign trade we note orders for \$25,000 of machine tools from Germany and over \$20,000 worth of agricultural machinery for shipment to Russia; shipments of \$30,000 worth of agricultural machinery and good shipments of pumps and machine tools to France; a shipment of \$15,000 worth of steel rails to Brazil, and a steady movement of finished products to England.

Pig Iron.—Prices are firm, deliveries heavy and offerings moderate. We quote, for Northern brands at tidewater: No. 1 X foundry, \$21; No. 2, \$20. Southern brands, New York delivery: No. 1 foundry, \$19; No. 2 foundry, \$20; No. 1 soft, \$20; No. 2 soft, \$19; No. 3, \$18.

Warrant Irons continue firm. Alabama No. 2 is \$14; No. 3, \$13; No. 4 and gray forge are steady at \$12½.

Bar Iron.—The market is good and prices are firm. We quote refined iron 2.08c. in large lots on dock, and common 1.75c.

Plate.—The local demand continues moderate, but prices are very firm. We quote large lots at tidewater: Tank, ¼-in. and heavier, 2.65@2.75c.; tank, 3-16 in., 2.75@2.85c.; shell, 2.75@2.85c.; flange, 2.85@2.95c.; marine, 2.95@3c.; firebox, 3@3.10c.; universals, 2.60c.

Steel Rails and Rail Fastenings.—Rails are quoted as nominally as low as \$28 for standard sections f. o. b. mills. Small rails are nominally quoted: 12-lb., \$34; 16-lb., \$34; 20-lb., \$34; 30-lb., \$32; 40-lb. to standard, \$30, with the usual advance for small orders. Angle bars are 1.80c.; spikes, 1.95c., and bolts, 2.25c.

Structural Material.—The call for structural material continues good and prices are firm. We quote for large lots at tidewater: Beams, 15-in., 2c.; tees, 2.05c.; channels, 2.05c.; angles, 2c.

Nails.—There is a steady demand. Cut nails are 2.30@2.35 for large lots on dock, and wire nails are 2.60@2.65.

**METAL MARKET.**

NEW YORK, July 14, 1899.

**Gold and Silver.**

**Gold and Silver Exports and Imports**  
At all United States ports in May and year.

	May.		Year.	
	1898.	1899.	1898.	1899.
GOLD.				
Exports	\$109,157	\$2,049,255	\$5,850,663	\$6,976,927
Imports	13,324,111	3,070,265	89,266,384	19,944,949
Excess I.	\$13,212,954	I. \$1,021,010	I. \$83,315,721	I. \$12,968,022
SILVER.				
Exports	4,184,432	4,436,549	20,441,347	23,726,819
Imports	1,574,479	3,010,353	10,864,236	12,004,188
Excess E.	\$2,609,953	E. \$1,426,196	E. \$9,577,111	E. \$11,722,631

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

**Gold and Silver Exports and Imports, New York**

For the week ending July 12th, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

Period.	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	\$4,155	\$97,995	\$619,678	\$77,509	E. \$448,329
1899..	11,418,767	7,268,768	14,899,082	1,794,366	E. 17,254,716
1898..	4,321,054	68,983,049	18,077,640	1,835,293	I. 48,219,648
1897..	11,161,564	1,933,885	21,955,898	1,489,949	E. 32,703,618
1896..	35,123,502	17,243,797	20,372,898	1,250,229	E. 37,002,274

The gold exported this week went chiefly to the West Indies and the silver to London and Central America. The gold imported came mostly from London, while the silver was principally from Central America.

The United States Assay Office in New York reports the total receipts of silver at 76,000 oz. for the week.

**Prices of Foreign Coins.**

	Bid.	Asked
Mexican dollars.....	\$ .48½	\$ .50
Peruvian soles and Chilean pesos.....	.43½	.46
Victoria sovereigns.....	4.86	4.89
Twenty francs.....	3.88	3.92
Twenty marks.....	4.78	4.83
Spanish 25 pesetas.....	4.78	4.84

**Average Prices of Silver per oz. Troy.**

Month.	1899.		1898.		1897.	
	London Pence.	N. Y. Cents.	London Pence.	N. Y. Cents.	London Pence.	N. Y. Cents.
January....	27.42	59.36	28.29	56.77	29.74	64.79
February....	27.44	59.42	28.89	56.04	29.68	64.67
March....	27.48	59.64	25.47	54.90	28.96	63.06
April....	27.65	60.10	25.95	55.02	28.36	61.85
May....	28.15	61.23	26.31	56.98	27.86	60.42
June....	27.77	60.43	27.09	58.61	27.58	60.10
July....	.....	.....	27.32	59.06	27.36	59.61
August....	.....	.....	27.48	59.54	24.93	54.19
September....	.....	.....	28.05	60.68	25.66	55.24
October....	.....	.....	27.90	60.42	26.77	57.57
November....	.....	.....	27.93	60.60	26.87	57.93
December....	.....	.....	27.45	59.42	26.83	58.01
Year....	.....	.....	26.76	58.26	27.55	59.79

The New York prices are per fine ounce; the London quotation is per standard ounce, 925 fine.

**Average Prices of Metals per lb., New York**

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.
Jan....	14.75	10.99	22.48	13.87	4.18	3.65	5.34	3.96
Feb....	18.00	11.28	24.20	14.08	4.49	3.71	6.28	4.04
March....	17.54	11.99	23.82	14.38	4.37	3.72	6.31	4.25
April....	18.43	12.14	24.98	14.60	4.31	3.63	6.67	4.26
May....	18.25	12.00	25.76	14.52	4.44	3.64	6.88	4.27
June....	17.93	11.89	25.85	15.22	4.24½	3.82	5.98	4.27
July....	.....	.....	.....	15.60	.....	3.95	.....	4.66
August....	.....	.....	.....	16.25	.....	4.00	.....	4.58
Sept....	.....	.....	.....	16.03	.....	3.99	.....	4.67
October....	.....	.....	.....	17.42	.....	3.78	.....	4.98
Nov....	.....	.....	.....	18.20	.....	3.70	.....	5.29
Dec....	.....	.....	.....	18.30	.....	3.76	.....	5.10
Year....	.....	.....	.....	15.70	.....	3.78	.....	4.57

The price given in the table is for Lake Copper. The average price of electrolytic copper in January was 14.2c.; in February it was 17.02c.; in March, 16.35c.; in April, 17.13c.; in May, 17.20c.; in June, 16.89c.

**Financial Notes of the Week.**

Beyond the usual midsummer falling off in activity there is little that is new to note in general business. In many departments there is much more work going on than is usual at this season, and in all the condition of affairs is generally good. Dearer money and the season have combined to make the speculative markets quieter and stocks lower. The demand for money in the European markets continues very strong, but the inducements offered have not resulted in any shipments of gold so far this week.

The silver market continues very dull and stagnant, with a rather drooping tendency. The

**Imports and Exports of Metals.**

Port.	Week, July 12.		Year, 1899.	
	Expts.	Impts.	Expts.	Impts.
<b>*New York.</b>				
Aluminum.....long tons	2	.....	277	10
Antimony ore.....	.....	155	.....	624
" regulus.....	.....	140	.....	561
" oxide.....	.....	.....	.....	11
Brass.....	.....	.....	55	.....
Chrome ore.....	.....	.....	1,988	.....
Copper, fine.....	1,129	969	28,346	11,481
" matte.....	.....	130	556	563
" ore.....	.....	5,731	10,399	152
" ash.....	.....	.....	20	.....
" sulphate.....	60	.....	11,403	.....
" other.....	.....	.....	30	.....
Cop-nickel matte.....	.....	.....	.....	131
Ferro-mangan'se.....	.....	170	.....	50
Iron ore.....	.....	.....	.....	1,107
" pig, bar, rod.....	156	1100	3,616	1,107
" pipe.....	1,030	.....	18,356	.....
" plates, sheets.....	123	.....	712	.....
" other.....	100	.....	1,115	.....
Lead.....	612	25	30,113	26,862
Manganese, ore.....	.....	.....	3,281	.....
Metals, old scrap.....	85	145	1,769	1,526
Composition.....	309	.....	4,857	71
Nails.....	942	.....	10,917	.....
Nickel.....	50	.....	1,012	723
" Ore.....	.....	.....	4,020	.....
" Rail's material.....	63	165	5,821	2,153
" Rails, old.....	509	.....	12,215	.....
Spiegeleisen.....	.....	.....	292	.....
Steel bars, plates.....	1,701	1682	30,165	9,452
" rails.....	930	.....	33,477	155
" hoops.....	.....	.....	486	.....
" wire.....	491	.....	20,499	54
" not spec'd.....	1,710	1130	9,071	1,529
Tin.....	.....	125	.....	14,768
" dross or ashes.....	.....	.....	60	.....
" and black plates.....	.....	1926	.....	18,317
Zinc.....	.....	.....	272	252
" dross.....	.....	.....	591	.....
" ashes, skim.....	.....	.....	1,320	85
" ore.....	.....	.....	3,006	.....
" oxide.....	133	110	2,307	922
<b>†Baltimore.</b>				
Alumina.....bags	.....	.....	.....	3,479
Antimony regulus.....casks	.....	.....	.....	175
Chrome Ore.....long tons	.....	.....	11	.....
Copper, fine.....	215	.....	19,352	.....
" matte.....	.....	.....	.....	.....
" sulphate.....	10	.....	1,447	.....
" pipe.....	.....	.....	100	.....
Ferro-manganese.....	.....	.....	1,737	.....
Ferro-silicon.....	.....	.....	184	.....
Iron pig, bar, etc.....	.....	.....	808	4,014
" ore.....	.....	3,696	78,418	.....
" pyrites.....	.....	2,658	30,661	.....
" other.....	.....	.....	687	.....
Manganese ore.....	.....	.....	15	19,400
Metals, scrap.....	65	.....	4,413	14
Nails.....	17	.....	455	.....
Pipe, iron & steel.....	174	.....	3,526	.....
Spiegeleisen.....	.....	.....	843	.....
Steel, bars, pl'es.....	67	.....	24,580	56
" wire.....	.....	.....	564	231
" rails.....	3,957	.....	31,725	.....
" not specified.....	30	.....	1,839	4
Tin.....	.....	.....	512	.....
" dross.....	.....	.....	.....	.....
" and blackplates.....	.....	36	.....	1,289
Zinc.....	.....	.....	25	5
" dross.....	.....	.....	152	.....
" skimmings.....	.....	.....	131	.....
" oxide.....	.....	.....	.....	.....
<b>*Philadelphia.</b>				
Antimony.....long tons	.....	.....	.....	10
Chrome ore.....	.....	.....	.....	1,370
Copper ore.....	.....	.....	26,354	.....
" old.....	.....	.....	11	.....
Ferro-manganese.....	.....	1225	.....	642
Iron, pig.....	.....	.....	675	.....
" ore.....	.....	110,406	81,675	.....
" old.....	.....	.....	732	.....
Manganese ore.....	.....	.....	32,153	.....
Spiegeleisen.....	.....	.....	1,250	.....
Tin.....	.....	.....	709	.....
" and black plates.....	.....	.....	907	.....
Zinc dust.....	.....	.....	15	.....
" ore.....	.....	.....	3,083	.....

**Total United States. †**

Articles.	May.		Jan.—May.	
	Expts.	Impts.	Expts.	Impts.
Antimony.....long tons	.....	70	.....	528
" ore.....	.....	249	.....	714
Copper fine.....	5,879	2,919	41,290	7,935
" sulphate.....	1,412	.....	9,376	.....
Iron, pig & bar.....	24,589	2,541	182,538	15,67

announcement of the report of the Commission and its plan favoring a gold basis for India has not affected the market, but will not tend to advance prices.

The statement of the United States Treasury on Thursday, July 13th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date of last week:

	July 6.	July 13.	Changes.
Gold	\$242,908,429	\$246,037,424	I. \$3,128,995
Silver	5,132,320	4,994,075	D. 138,245
Legal tenders	15,357,959	15,184,700	D. 173,259
Treas. notes, etc.	746,006	935,147	I. 189,141

Totals .....\$264,194,754 \$267,151,346 I. \$2,956,592  
Treasury deposits with national banks amounted to \$78,149,206, a decrease of \$1,890,549 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending July 8th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

	1897.	1898.	1899.
Loans and discounts	\$533,766,600	\$633,675,300	\$793,852,900
Deposits	607,682,500	758,068,000	902,178,900
Circulation	13,782,900	14,620,400	13,624,200
Reserve:			
Specie	90,505,200	180,498,700	176,827,600
Legal tenders	102,776,800	62,363,600	53,779,600
Total reserve	\$193,282,000	\$242,862,300	\$230,607,200
Legal requirements	151,920,625	189,517,000	225,544,725
Balance, surplus	\$41,361,375	\$53,345,300	\$5,062,475

Changes for the week this year, were increases of \$6,968,900 in loans and discounts, and \$40,700 in circulation; decreases of \$2,948,900 in deposits, \$5,638,500 in specie, \$4,810,800 in legal tenders, and \$9,212,057 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the hold ings at the corresponding dates last year:

Banks.	—1898.		—1899.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Assn.	\$180,498,700	.....	\$176,827,600	.....
England	185,515,260	.....	161,583,395	.....
France	375,159,085	\$247,619,120	379,338,585	\$243,188,040
Germany	133,435,000	68,740,000	133,540,000	68,790,000
Aus.-Hun.	174,155,000	63,155,000	181,250,000	63,690,000
Spain	49,760,000	22,580,000	64,800,000	66,980,000
Neth'nds	15,205,000	34,945,000	15,825,000	31,075,000
Italy	74,555,000	9,660,000	75,535,000	10,010,000
Russia	556,790,000	22,005,000	478,825,000	25,960,000

The returns of the Associated Banks of New York are of date July 8th, and the others are of date July 6th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold coin only.

Shipments of silver from London to the East for the week ending June 29th, 1889, are reported by Messrs. Pixley & Abell's circular as follows:

	1898.	1899.	Changes.
India	£2,820,240	£2,381,300	D. £438,440
China	332,648	641,256	I. 308,648
The Straits	115,162	41,046	D. 74,116

Totals .....£3,268,150 £3,064,242 D. £203,908  
Arrivals for the week, this year, were £148,000 in bar silver from New York, and £12,000 from Chile; total, £160,000. Shipments were £126,000 in bar silver to Bombay.

Money is in demand in India, and exchange has been firm at 16d. per rupee, a fraction over having been paid for special transfers. All the Council bills offered in London were taken up at 16d.

A London despatch says:—"The report of the Indian Currency Commission, appointed in 1898, has just been made public. It concurs in the decision of the Indian Government not to revert to the silver standard, and advises that immediate measures be taken to establish effectively a gold standard. The report adds that the British sovereign ought to be made legal tender in and the current coin of India, and the Indian mints opened to the unrestricted coinage of gold under conditions similar to those governing the Australian branches of the Royal Mint. It advises that no limit be at present imposed on the amount for which rupees are legal tender. It declares that the Indian Government ought not to be compelled to buy rupees with gold on demand for merely internal purposes, but a gold reserve ought to be freely available for foreign remittances whenever exchange falls below the specie point. The Government ought to continue to give rupees for gold, the report adds, but fresh rupees should not be coined until the proportion of gold in the currency is found to exceed the requirements of the public. In conclusion the report recommends that the value of the rupee be fixedly maintained at 16d. sterling."

Other Metals.

Daily Prices of Metals in New York.

July.	Sterling Exchange.	Silver.			Copper.			Tin.	Lead.	Spelter.
		Fine oz.	Lon. Pnce	Lake cts. @ lb.	Elec. trolytic. @ lb.	Lon'd'n stand. @ ton.	cts.			
8	1.87 3/4	60 3/4	27 3/4	18 3/4	17	.....	28 3/4	4.47 1/2	5.90	
10	1.87	60 3/4	27 3/4	18 3/4	17	77 10 0	28 3/4	4.50	5.90	
11	1.87	60 3/4	27 3/4	18 3/4	17 3/4	77 2 6	27 3/4	4.50	5.87 1/2	
12	1.87	60 3/4	27 3/4	18 3/4	17 3/4	77 0 0	28	4.52 1/2	5.87 1/2	
13	1.87	60	27 3/4	18 3/4	17 3/4	77 0 0	28 1/4	4.52 1/2	5.87 1/2	
14	1.87	60	27 3/4	18 3/4	17 3/4	77 0 0	29 1/4	4.55	5.87 1/2	

The quotations given for electrolytic copper are for cakes, ingots and wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market has been very steady, and we hear of numerous transactions. Manufacturers have been buying more liberally in consequence of receiving larger orders for their products. For near-by delivery copper is again growing scarce and a number of producers are reported to be fully sold for some time to come. In Lake copper business has been done at advancing prices, and we have to quote for this description 18 3/4c.; electrolytic copper in cakes, wirebars and ingots is held for 17@17 1/2c., and in cathodes for 16 1/2@16 3/4c. Casting copper is firm at 17c. Our cables from abroad indicate a considerable improvement in the consumptive demand, but we cannot find that much export business has been consummated, no doubt due to the fact that the Europeans are not yet ready to pay the prices asked.

The market for speculative sorts in London has fluctuated somewhat, being affected there by political influences as well as by the high rates for money. It opened this week at £77 10s., the figure at which it had closed last week, but on Tuesday declined 10s. to £77, and on Thursday further 2s. 6d. to £76 17s. 6d. It closes at £77 for spot, £77 5s. for three months.

Refined and manufactured sorts we quote: English tough, £79 10s.@£79 15s.; best selected, £81@£81 10s.; strong sheets, £87 10s.@£88; India sheets, £85@£85 10s.; yellow metal, 7d.

Tin.—The market continues on its upward course, and this week has scored a further advance of £3. The fluctuations in the London market were quite violent. It had closed last week at £128 for spot and £129 5s. for futures, and opened at these prices, but on Tuesday dropped £2 to £126 2s. 6d., recovering on Wednesday to £128 7s. 6d. and advancing on Thursday to £131. It closes at £131 12s. 6d. for spot, £132 15s. for three months.

The market here has improved in sympathy with that in London, and a large business has been transacted. At the close we have to quote 29 1/4c.

Lead.—The strikes in Colorado continue, and unfortunately a settlement appears to be quite remote. The demand for lead is very large and stocks are diminishing rapidly. It is feared that unless the troubles in Colorado are settled very shortly, a great scarcity of the metal in this country will be felt. Prices have advanced and we have to quote lead in New York at 4.52 1/2@4.55c. In the West the prices are 4.50@4.52 1/2c. St. Louis, 4.52 1/2c. Chicago.

The foreign market has been quiet and Spanish lead is quoted £14 7s. 6d.@£14 8s. 9d.; English lead at £14 12s. 6d.@£14 15s.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is strong and advancing. The latest sales are on a basis of 4.52 1/2@4.55c., East St. Louis. The demand is rather active.

Spelter.—There is no special feature this week, the market having been quiet and dull. There have been rumors that some of the smelters have had to shut down for want of ore, but this is denied.

Demand continues very light and there appears to be a tendency towards lower prices. We quote the metal in East St. Louis at 5 1/4c., and New York at 5 1/2c.

The European market has improved somewhat and is quoted nominally at £25 17s. 6d. for good ordinaries, with specials 5s. higher.

Antimony is unchanged. Cookson's is held for 10 1/2c.; Hallett's, "C" and U. S. Star for 10c.

Nickel continues on unchanged lines, and no alteration in prices can be reported. We quote for ton lots, 33@36c. per lb., and for smaller orders 35 1/2@38c. London prices are 14@16d. per lb., according to size of order.

Platinum.—Demand is active and prices continue high. For large lots \$15.50 per ounce is now quoted in New York, for smaller orders, \$16@17. The London quotation is 62@64s. an ounce.

Quicksilver.—The New York quotation remains unchanged at \$45 per flask. The London price has been raised 2s. 6d., and is now £8 7s. 6d., with the same quotation given from second hands.

Quicksilver receipts at San Francisco in June were 1,632 flasks, against 2,057 last year. For the six months ending June 30th the receipts were 11,513 flasks, which compares with 11,529 flasks

in 1898. This quantity does not include the metal shipped from the mines direct to interior points. Shipments from San Francisco by water for the half-year were: British Columbia, 33 flasks; Mexico, 2,394; Central America, 875; Australia, 60; Siberia, 2; China, 2,000; New York, 118; total, 5,482 flasks. Shipments by rail are not reported.

The Minor Metals.—Quotations are given below for New York delivery:

	Per lb.	Per lb.
Aluminum	.....	.....
No. 1, 99% ingots	35@37c.	Bismuth..... \$1.45@1.50
No. 2, 90% ingots	31@34c.	Magnesium..... \$2.75@3.50
Rolled sheets	38c. up	Phosphorus..... 40@50c.
Alum-bronze	20@23c.	Tungsten..... 70c.
Nickel-alum	33@39c.	Ferro-tungsten, 60%.

Variations in price depend chiefly on the size of the order.

LATE NEWS.

Reports are current that the American Steel and Wire Company has purchased the iron ore mines and property of Witherbees, Sherman & Co., at Port Henry, in Essex County, N. Y. The price is said to be \$1,500,000.

The mineral oil exports from the United States in June were: Crude, 10,018,249 gals.; naphtha, 1,133,089 gals.; illuminating, 69,837,669 gal.; lubricating and paraffin, 5,327,572 gals.; residuum, 898,170 gals.; total, 87,214,749 gals., against 87,216,379 gals. in May and 93,109,931 gals. in June, 1898.

Press despatches report that a syndicate is about to purchase the properties and plant of the Thomas Iron Company, of Hokendaqua, Pa. The company has furnaces at Hokendaqua and at Alberts, in Lehigh County, at Glendon and Hellertown, in Northampton County, Pa., and at Niles, in Trumbull County, O. The syndicate offers about \$80 a share.

A despatch from Chicago, July 15th, says: "The officers of the American Tin Plate Company and the Wage Committee of the Amalgamated Association of Iron and Steel Workers, who have been in daily conference for the past two weeks over the question of wages of the tin workers employed by the American Tin Plate Company, agreed on a scale to-day. The scale, which was signed by the Tin Plate officials and the Amalgamated Association Committee, grants a straight increase of 15%. The increase takes effect from July 1st. The wage list as adopted is to be the minimum scale for the year ending June 30th, 1900. At last night's session bars instead of billets and a ratio of one-seventh instead of one-fifth were practically decided on as a basis for figuring the scale of wages. This was abandoned at to-day's session, however, the scale as adopted being based on \$4.25 as the selling price of a 100-lb. box of coke tin plates. On each 10c. increase in the price per box 2% advance on the scale as adopted will be paid, while for each 10c. decrease a deduction of 2% will be made. Over 30,000 tin plate workers are benefited by the increase."

The figures of the total imports and exports of the United States during the fiscal year ending June 30th, 1899, have been completed by the Bureau of Statistics of the Treasury Department. They show that our total foreign trade, combined imports and exports, was the largest in the history of this country, aggregating a money value of \$1,924,520,813, which exceeded our foreign trade in 1898 by \$76,988,829. The figures also show that the total exports of the year were \$1,227,443,425, against \$1,231,482,330 in the fiscal year 1898. The exports of the year thus fall but \$4,038,905 below those of 1898, and are \$175,000,000 larger than in any preceding year except 1898. The decrease in the value of exports of breadstuffs and cotton is nearly made up by the increased exports of manufactures, which seem likely to amount to \$335,000,000 in the fiscal year 1899, as against \$290,697,354 in 1898, an increase of about \$45,000,000, though the exact details of the exports by classes cannot be given yet. The statement for the fiscal year ending June 30th is as follows:

	1898.	1899.
Exports	\$1,231,482,330	\$1,227,443,425
Imports	616,049,654	697,077,398
Excess, exports	\$615,432,676	\$530,366,037
Add excess of exports, silver	.....	25,621,977
Total	.....	\$555,988,014
Deduct excess of imports, gold	.....	51,432,517
Net apparent balance	.....	\$504,555,497

The imports of gold for the fiscal year 1899 aggregated \$88,954,603, and the exports \$37,522,086, being a decrease of \$31,437,071 and an increase of \$22,115,695, respectively, as compared with the fiscal year 1898. Compared with the two previous years, the excess of gold imports over exports was: 1897, \$44,653,200; 1898, \$104,985,283; 1899, \$51,432,517. The imports of silver for 1899 were \$30,696,878, a decrease of \$230,903, and the exports \$56,318,855, an increase of \$1,213,616. The excess of silver exports over imports was: 1897, \$31,413,411; 1898, \$24,177,458; 1899, \$25,621,977.



MINING STOCKS.

Complete quotations will be found on pages 86, 87 and 88 of mining stocks listed and dealt in at:

Baltimore,	Philadelphia.	Paris.
Boston.	St. Louis.	Rossland.
Colo. Springs.	Salt Lake.	Shanghai.
Denver.	San Francisco.	Toronto.
New York.	London.	Valparaiso.
	Mexico.	

New York. July 14.

The local market is uninteresting outside of the higher-priced copper securities. The feature is Amalgamated Copper, which advanced 4 1/2 points this week, selling on Thursday at \$99 1/2 for a small lot. Persistent rumors have been circulated by curbstone brokers about a 2% quarterly dividend to be declared by the Amalgamated Copper Company within the next 30 days. No official announcement, however, has yet been made. It may be said, though, that last year the total dividends paid by the constituent companies—the Anaconda, Parrot, Colorado Smelting and Boston & Montana—amounted to \$5,683,000, or nearly 8% on the \$75,000,000 capitalization of the Amalgamated Copper Company. So far on the present year's dividend account \$3,633,000 has been declared. This leaves \$2,050,000, or over 2%, on Amalgamated's capitalization, to be paid from now until next January, to equal last year's distribution of the regular dividend payers, to say nothing about the other properties that are included in the combine.

Anaconda Copper has receded several points from last week, selling around \$53 3/4, owing partly to the suits now pending in the Butte courts. On Thursday 22,330 shares changed hands at \$54 1/2 @ \$57 1/4.

Tennessee Copper was in better request, gaining 1 1/4 points to \$21 1/4 on July 10th, but as the week closes \$19 @ \$20 are heard on curb. British Columbia Copper sold at \$11, and is now quoted \$10 1/4 @ \$11 1/4.

American Smelting & Refining shares were quiet, though slight gains were made; common sold up to \$36, and preferred up to \$84 1/4.

In the Comstock group Consolidated California & Virginia dropped to \$1.90, or about 10 points from last week.

The Colorado stocks showed a fair business, and there was more inquiry for Small Hopes. Californians were quiet.

Miscellaneous dividends declared include the Flat Top Coal Land Association, 1% on preferred stock and 1/2% on common, payable Aug. 1st; General Electric Company, regular semi-annual of 3 1/2% on preferred stock, payable July 31st. The Cleveland Cliffs Iron Company has increased its quarterly dividend from 1% to 2%, owing to the improved demand for iron ores.

Auction sales included all right, title and interest of the Northwest Copper Company and the Northwest Railway Company in and to \$5,000 Northwest Railway Company's bonds, due July 1st, 1918; January, 1899, coupons on for \$70.

The National Glass Company has been incorporated under Pennsylvania law, with \$20,000,000 capital, to include most of the table glass manufacturers of the country. The more important concerns in the combine are United States Glass Company, McKee Brothers, Rochester Tumbler Company, Tarentum Glass Company, Campton Glass Company, Indiana Tumbler & Globe Company, Riverside Glass Company, Model Flint Glass Company, Fairmount Glass Company, Seneca Glass Company, Royal Glass Company, Central Glass Company, Greensburg Glass Company, the Beatty-Brady Glass Company and the Crystal Glass Company.

Boston. July 13.

(From Our Special Correspondent.)

Last week I wrote that the activity and the sharp rise in prices which followed the holiday was wholly an inside movement. The course of the market this week has justified that statement. The public declined to be drawn in by the little play enacted for their benefit, or to believe that the boom was on again, and matters quickly settled down again. We have had this week a quiet and narrow market, and dealings in copper stocks have been comparatively small. The only special movement has been in Franklin, at which a drive was made on the strength of some advices from the Lake unfavorable to the condition of the property. The statements really contained nothing which was not known some time ago, but their publication was made use of to reduce quotations.

Other movements were chiefly in the Amalgamated group of stocks, and were inside dealings. Butte & Boston has gone up \$2 to \$81, and Arcadian sold at \$62 1/2, while Boston & Montana was \$365. Amalgamated Stock sold at \$95.

Calumet & Hecla sold at \$795; Tamarack at \$220; Quincy at \$165; Osceola, \$87. Quincy has declared a \$6 dividend, which compares with \$3.50 paid six months ago.

Among other quotations are Old Dominion at \$38 1/2; Santa Fe, \$14 1/2; Mass., \$12; Old Colony, \$11 1/4.

Outside the copper stocks most of the dealing was in the new zinc-lead shares; but it is only fair to say that the public does not yet know just how to take these and does not deal in them very freely as yet.

Dominion Coal was strong and in demand, selling at \$54. There is also quite a demand for New England Gas & Coke, which was quoted at \$22 to-day.

The Security Mining and Power Company, organized to reopen and develop some old mines in Tuolumne County, California. The capital is \$2,000,000 in 80,000 shares of \$25 each. A peculiarity of the offer is that 40,000 shares are guaranteed, the guarantors agreeing to buy them back at par after an interval of some years. How good this guarantee is does not appear. The ordinary shares are given away as a bonus or makeweight with the guaranteed stock.

The notice served by the Governor of Arizona and published in the "Engineering and Mining Journal" last week has attracted a good deal of attention, and some people who bought Arizona wildcats pretty freely a while ago are trying to unload quietly. I have looked in vain in the Boston papers—which published flaming advertisements of the Val Verde and the rest—for any comments on Governor Murphy's timely deliverance. Many people are now more inclined to listen to the "Engineering and Mining Journal's" warnings than they were a while ago. Just how much of this kind of trash "securities" was placed here it is hard to say; but the total must be large.

San Francisco. July 8.

(From Our Special Correspondent.)

With a holiday extending over half a week a quiet market might be expected. Some sanguine people have been predicting a great revival of interest after the break, but very few really believed anything of the kind. The trading has been on the usual lines, on a small scale, and among the old crowd. Practically all hopes of interesting outsiders until after the vacation season is over have been given up.

On such market as we have had prices have kept up fairly well, and the quotations were steady; but total dealings which do not foot up over \$6,000 or \$8,000 a day are not of much importance.

Some quotations noted are: Consolidated California & Virginia, \$2; Ophir, \$1.05 @ \$1.10; Mexican, 55c.; Best & Belcher, 54c.; Potosi, 49c.; Gould & Curry, 40c.; Chollar, 30c.; Occidental, 25c.

The sales on regular call at the San Francisco Stock Exchange for the year to date compare as follows:

January, shares .....	1598.	1899.
February .....	157,360	121,955
March .....	151,065	350,800
April .....	166,260	272,625
May .....	203,355	209,215
June .....	119,535	164,580
June .....	120,780	20,375
Total .....	918,355	1,320,610

It will be seen that every month this year shows some improvement over last year. The total, however, is not very large. The average for June was 8,055 shares a day.

Salt Lake City, July 8.

(From Our Special Correspondent.)

Sultry dullness prevails, and it looks as though the mining share market has settled down for a midsummer nap. Local holders, apparently, are loaded to the limit, and outside support is lacking, except in sporadic spurts—like the recent Joe Bowers whirl. Trading was lighter than for any week for over a year, and this was emphasized by the double holiday, there being no call till Wednesday.

Ajax still sags; there are hints of an assessment. Bullion-Beck holds strong; the \$10,000 dividend will be declared Monday. Centennial-Eureka is in demand; the pending sale seems assured. Chloride-Point shows a slightly better tone. Daisy is the leader of the week, softening to 25 1/2, then making a spurt, closing 32 bid. It savors of manipulation. Daly is firm and higher. Daly West holds above \$12.

An extension is obtained on the Dalton & Lark option, and Mr. Ellsworth Daggert has begun the preliminary work for his expert examination. The mines are unwatered. Considerable exploration is to be done in the next 60 days, the outcome of which is awaited with interest. Eagle & Blue Bell continues in favor. Four Aces has taken a rest.

Geyser Marion shows no change. Grand Central pays the usual dividend and the shares are again stronger. Joe Bowers has done a lively business above and below 20, closing at the low notch. The Burnham litigation is not settled, but it is believed it is in a fair way to be soon. Mammoth softened on paying the \$80,000 dividend, and conflicting yarns are in circulation as to the plans of the new management. I am told another dividend will be paid Aug. 1st—perhaps \$40,000. Mercur pays the \$50,000 dividend

on Monday. There are considerable offerings around \$7. It is whispered a fresh surprise is in store which will gladden the share owners Northern Light is in better form. Sunshine is more strongly held. Silver King pays the \$50,000 dividend on Monday. South Swansea is higher. Swansea is stationary. The \$5,000 dividend will be paid July 10th. Sacramento affords nothing new. Star Consolidated's slump is unexplainable, and from all reports is unwarranted. It is said a new deal is on, and that there is a move to gather in a block of stock.

Paris. July 2.

(From Our Special Correspondent.)

The mining stock market has been again affected by the prevailing political excitement, and has been somewhat neglected, while the general tone has been weak.

The copper shares have shown this in a marked degree, a downward reaction having followed the recent high prices. Rio Tinto ordinary shares, for instance, have fallen 90 fr., and the whole list shows lower quotations.

The market for the African gold stocks has been very much agitated and in general weak. The uncertain condition of the relations between Great Britain and the Transvaal, and the present ascendancy of Mr. Chamberlain and the party of forcible intervention seem to make trouble very probable. The financial interests in favor of compromise are very strong, however, and they may prevail at Pretoria, especially as they can present certain arguments which are said to have weight there.

The shares of Le Nickel continue to maintain a good quotation. The arrangements made to pay off the 5% obligations will put the finances of the company in much better condition.

There has been little movement in the metallurgical shares, and in some cases a reduction in prices. The small reactions are not due to any special causes, but may be traced to the general heaviness of the market.

The very large profits realized last year by the Russian coal and metallurgical companies have directed attention to their stocks, and they are in demand, notwithstanding the high quotations of most of them. The iron industry of Russia is growing, and it has received a great impetus from the very large expenditures which are being made on the Siberian Railroad and other enterprises. This growth seems likely to continue for some years to come, and there is no probability that the Government will change its policy of encouraging Russian works. Doubtless these conditions will favor the establishment of new plants; but it will be a long time before the production can be increased to a point which will cause competition and lower prices.

The Societe des Usines de Briansk is arranging to consolidate its debt into one form, and for that purpose has voted to issue debentures to the amount of 8,000,000 roubles. This will put its finances into better shape.

The Spanish Government is trying to make arrangements for carrying its debt, and the proposition made by the Finance Minister will probably be carried through. The interest on the exterior debt—the bonds held abroad—will continue to be paid in gold, but will be subjected to a tax of 20%. These are better terms than the bondholders had hoped for, and they will be accepted without much objection. On the other hand, as a result of the new measures, the interest on the obligations of the Spanish railroads will be paid in paper and not in gold, thereby reducing the amount which the bondholders will receive by one-half, or perhaps more. As our people are very large holders of all sorts of Spanish securities, these settlements will affect them very much. The results are discouraging to speculation, since they will limit the financial ability of many speculators who are loaded with Spanish paper of different sorts.

Mr. Waldeck-Rousseau is getting his ministry into some sort of working order, and it is to be hoped that he will succeed. As a compromise to carry us over the present crisis it may work; but no one expects a long life for it, though few want to think seriously of what may follow it.

Toronto, Ont. July 12.

(From Our Special Correspondent.)

The mining share market this week has been fairly active, despite the stringency of the money market. Golden Star remains the leading feature. A much better feeling is noticeable in this stock, which holds firm at 39 @ 40c. Iron Mask is coming into favor again, and there has been a steady demand from Van Anda and White Bear. Minnaha, which has been somewhat sluggish of late, is reviving. Winnipeg, which is a proposition in the Boundary Creek District, is being held quite firm, and the price is steadily advancing. Reports from Camp McKinney District are very encouraging, and it is stated that the Cariboo Consolidated in its last monthly return showed an increase of over 100 ounces of gold, over any other month since the mine has been operated. Superior is still advancing steadily.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Adams Con., Alamo, Alliance, Anaconda, etc., with columns for location, par value, and prices for various dates in July.

BOSTON - MASS.

Table of stock quotations for Boston, listing companies like Aetna, Adven's, Allouez, Am. Z. & S., etc., with columns for location, par value, and prices for various dates in July.

\*Official quotations Boston Stock Exchange. Total sales, 68,705.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like Am. Sm. & Ref., Am. S. & W. Co., Central of N. J., etc., with columns for location, par value, and prices.

PHILADELPHIA PA.

Table of stock quotations for Philadelphia, listing companies like Bethlehem I., Cambria Iron, Cambria Steel, etc., with columns for location, par value, and prices.

VALPARAISO. CHILE.\*

Table of stock quotations for Valparaiso, Chile, listing companies like Arturo Prat, Caracoles, Huantajaya, etc., with columns for location, capital, and prices.

\*Special report of Jackson Bros. Values are in Chilean pesos or dollars.

COLORADO SPRINGS COLO.

Table of stock quotations for Colorado Springs, listing companies like Alamo, Anaconda, Argonaut, etc., with columns for location, par value, and prices.

\*Colorado Springs Mining Stock Exchange. Sales for week ending July 3rd, 11,823; quotations from July 6th to July 8th by telegraph. \* Holiday.

BALTIMORE, MD.

Table of stock quotations for Baltimore, listing companies like Atlantic Coal, Hope St. L., etc., with columns for location, par value, and prices.

ST. LOUIS, MO.

Table of stock quotations for St. Louis, listing companies like Am. Gold, Central L., etc., with columns for location, par value, and prices.

SHANGHAI, CHINA.\*

Table of stock quotations for Shanghai, China, listing companies like Jelubu Mg. & Trad., unjon Mg. Ltd., etc., with columns for country, value, and prices.

\*Special report of J. P. Bisett & Co. The prices quoted are in Shanghai taels.



STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing various mining and industrial companies with their share prices and sales figures.

\* Official Quotations Denver Stock Exchange. Sales: Mines, 19,300 shares; Prospects, including those mentioned, 3,000 shares; Miscellaneous, 25,000 shares; total, 47,300 shares.

SALT LAKE CITY, UTAH.

July 1.

Table of stock quotations for Salt Lake City, Utah, listing various mining companies and their market prices.

\* From Our Special Correspondent. † Utah companies. ‡ Mines in Vanderbilt, Cal. § Mines in Tuscarora, Nev.

ROSSLAND, BRITISH COLUMBIA.

July 6.

Table of stock quotations for Rossland, British Columbia, listing various mining companies and their market prices.

\* From Our Special Correspondent.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, California, listing various mining and industrial companies with their share prices and sales figures.

Official telegraphic quotations of San Francisco Stock Exchange

TORONTO, CAN.

Table of stock quotations for Toronto, Canada, listing various mining and industrial companies with their share prices and sales figures.

\* Official quotations of the Standard and Toronto Mining and Industrial Exchanges. Total shares sold, 219,800.

MEXICO.

June 29.

Table of stock quotations for Mexico, listing various mining companies and their market prices.

Note:—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many newer companies have a nominal par value, usually \$50 or \$100. Prices are in Mexican dollars.

PARIS.

June 22.

Table of stock quotations for Paris, listing various mining and industrial companies and their market prices.

STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Country, Authorized capital, Par value, Last dividend, Quotations. Includes companies like Alaska-Mexican, Anaconda, and various mining operations.

† Dividend pending. \* Ex-Dividend.

Table with columns: NAME OF COMPANY, Location, Meeting, Date, Place of Meeting. Lists various company meetings and their locations.

ASSESSMENTS.

Table with columns: NAME OF COMPANY, Location, Div. Amt., Office. Lists company assessments and office addresses.

DIVIDENDS.

Table with columns: NAME OF Co., Date, Am't., Paid 1899, Grand Total. Lists dividends for various companies.



DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Assessments. Includes entries for Etna Cons., Alaska-Treadwell, Alamo, Alice, American Gold, etc.

G. Gold. S. Silver. L. Lead. C. Copper. B. Borax. \* Non-assessable.

Note.—This table is corrected up to June 5. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table with multiple columns listing various chemicals and minerals such as Abrasives, Carbide, Cement, Chlorine, Chrome Ore, Clay, Copper, Cream of Tartar, Explosives, Fluorspar, Fuller's Earth, Graphite, Gypsum, Infusorial Earth, Iodine, Iron, Kaolin, Kroyolith, Lead, Lime, Magnesite, Magnesium, Manganese, Marble, Mercury, Mica, Mineral Wool, Monazite, Nickel, Oils, Potassium, and Sulphur. Each entry includes a description, unit of measure, and price.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to June 16th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.