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An important statement is that of Mr. W. Ogilvie, of the Canadian Geological Survey, to the effect that coal exists in the upper part of the Klondike Valley. Mr. Joseph Ladue, of Dawson City, also mentions the occurrence of coal there. Further information as to this point will be awaited with interest.

The asbestos cloth used as a filtering medium in the large chlorination barrels is now being replaced by a finely perforated sheet of chemical lead, the perforations of which are a little finer than that to which the ore being treated has originally been crushed. The sheet is supported on a suitable open frame work to give the maximum amount of filtering area. The life of a filter is in this way very much increased and the cost of treatment materially lessened. The idea is not a new one, having been used some years ago in the gassing tubs of the old Plattner process.

Mr. William Ogilvie, the Dominion Land Surveyor who has been stationed in the Klondike and has just returned from there, is quoted in the daily press as making a statement that 23 claims in the district have produced \$826,000, and \$70,000,000 is not an exaggerated estimate of the amount that will be produced by 180 claims on Bonanza, Hunker and Eldorado creeks during the next three years. We think it doubtful if Mr. Ogilvie, who has the reputation of being a very careful and conservative person, ever made such a statement, since it is morally certain that there have been insufficient developments, no surveys and no systematic examination of the Klondike diggings which would enable an engineer to make any such estimate of the value of the gravel disclosed. We think it proper to call attention to this, since in the existing excitement over the new discoveries such a statement attached to Mr. Ogilvie's name will be powerful in stimulating the rush of inexperienced persons to Alaska if not corrected.

The s. s. Portland from St. Michael arrived at Seattle, on August 29th. She brought 13 miners from the Klondike, but contrary to popular expectations they had very little gold. In the meanwhile the rush to Alaska has been going on in an utterly irrational manner, and it is certain that the more part of those who have gone thither will have to spend the winter at St. Michael or at Dyea, neither of which is a hospitable place. At both, prices are high and comforts few, and it is likely that those persons who are obliged to winter there will experience much suffering. As to those who have managed to ascend the Yukon River or cross the Chilkoot Pass, their predicament is likely to be worse, since there is now little doubt that more have gone in than there is provision to feed. Good advice in this direction has been thrown to the winds, and, if it is not already too late, strong measures should be taken to prevent any more from incurring this risk, not only for the sake of the foolhardy, but also for those persons now in the Klondike, whose charity is sure to be imposed upon.

Mr. Joseph Ladue, in a paper in McClure's Magazine for October, says that he foresees starvation ahead not only for the venturesome and improvident, but also for those who have taken enough and those already on the ground. "Won't the food have to be divided up even all around?" he asks. Mr. H. N. Stanley, who has been at St. Michael for the Associated Press, writes: "To draw provisions for the trip from Dyea to Dawson any time before the spring breaks up is an impossibility. Relief for those caught in the Klondike after winter sets in is equally impossible, so in the name of humanity I ask that a stop be put to this wholesale transportation of people without supplies. Let no man be allowed to enter that region unless he carries with him enough food and clothing to last him a year."

We fear that the news which comes from the Yukon next summer will be not only of riches and gold, but also of fearful suffering and loss of life. It is particularly distressing to know that many women and children have been taken into this barren region, which is about to be cut off from communication with the rest of the world for nearly nine months.

The Production of Silver from Silver-Lead and Silver-Copper Ores.

We have received numerous inquiries as to the proportion of the silver production of the world which is derived from gold-silver, lead-silver and copper-silver ores. There are no statistics in existence which would enable us to answer this question definitely. Even if the compilation of such statistics were undertaken, it would be difficult to draw a line of sharp distinction between the various kinds of silver-bearing ore. In the United States, for instance, there would be no doubt as to the classification of the ores of Butte, Montana and the Coeur d'Alene District of Idaho, in which either copper or lead is superior to silver in value; nor as to much of the ore of Leadville, Colo. There are, however, many mines producing silver ore with a little copper or lead which is sold to silver-copper or silver-lead smelters, and could not be worked profitably in any

other way, though the chief value of the ore is in its silver tenor, and there would be much uncertainty as to how these ores should be classed.

In the United States in 1896, the silver-copper mines of Butte and the silver-lead mines of Leadville and the Cœur d'Alene produced about 20,000,000 ounces of silver. The total silver production of the United States in that year according to the statistics of *The Mineral Industry* was 58,488,810 ounces. There is a good deal of silver-lead ore produced in the Castle and Neihart districts of Montana, in the Wood River region of Idaho, in Bingham Canyon and the Tintic District of Utah, in the Magdalena Mountains in New Mexico, in numerous parts of Colorado besides Leadville, and at isolated points elsewhere in the Rocky Mountains. The ores of the Comstock Lode and the De Lamar mines of Idaho are essentially gold-silver, i. e., their gold contents are of value equal to or greater than their silver contents. Moreover, there is a considerable amount of silver produced by gold mines proper, of which the bullion obtained in retorting amalgam or from smelting cyanide slimes seldom assays more than \$18 per oz. It is probable, therefore, that fully one-half of the present silver product of the United States is obtained from ores in which gold, lead or copper are the more important metals. Certainly a good deal more than one-half of the American silver is produced by silver-lead and silver-copper smelters, who buy large quantities of purely silver ores, for which in many localities smelting is the cheapest method of reduction. Their silver finally appears in the market as a product obtained from the refining of base lead or crude copper.

In the case of Australia this probably is true to even a greater extent, since the most important producers of silver there are the Broken Hill mines, which have an ore rich in lead. These mines furnish more than one half the silver output of all Australasia. Even in Mexico a large part of the silver production is now derived from silver-lead and silver-copper ores. In 1896 the value (in Mexican currency) of the silver exported from Mexico in base lead bullion and blister copper was \$28,565,843; \$9,971,053 left the country in the form of ores, going chiefly to American silver-lead smelters, and \$1,495,306 was exported in the form of silver sulphide, being presumably the product of leaching works. The amount of silver deposited for coinage in the Mexican mints was \$20,941,976. The last, together with the silver sulphides exported, indicates more or less the production of silver by amalgamation and lixiviation in Mexico at the present time. It undoubtedly overstates the truth, however, since there is a good deal of silver produced by lead smelters in the mountains who cupel their bullion and deposit the doré bars at the mints.

There is at the present time in the United States very little silver produced directly by amalgamation or lixiviation. According to *The Mineral Industry*, Vol. V. in 1896 there were only about 4,000,000 ounces of silver obtained in the United States by pan amalgamation and tank lixiviation. In Australia, Germany and Spain the proportion is surely smaller. In Mexico the patio process is a good deal less important than it used to be, and of the six countries ranking as the most important silver producers of the world it may be said that Bolivia is now the only one where the old methods hold the premier place.

Accidents in American Metal Mines.

Most of the States of the Union have laws governing coal mines, and corps of inspection to insure their enforcement. These were summarized by Mr. W. F. Willoughby in an excellent article in *The Mineral Industry*, Vol. V., "Mine Labor as Regulated by Law in the United States." In general these laws are good, although in many States they are not so stringent as they should be; but with the exception of a few States the collection of statistics relating to accidents is very imperfectly done, if at all. We are now referring only to coal mines, which are commonly and erroneously believed to be more hazardous to life than metal mines. The number of States which have by law established supervision over the latter is very small; the number which collect statistics of this class of accidents is still smaller. For these reasons the report of the Commissioner of Mines of Colorado, one of the States which has taken up this necessary work, for 1896 is of great interest, especially since the distressing condition of affairs which it reveals there exists probably in the other States of the Rocky Mountains, Montana, Idaho, Utah, etc., where the methods of mining are similar.

In commenting upon the recently published Colorado statistics we shall for the sake of comparison refer to the statistics of accidents in metal mines of the United Kingdom in 1896, in which about the same number of men were employed as in Colorado. The total number of persons employed in mining in Colorado in 1896 was 25,545, of whom 15,924 worked underground. In England there were 33,119, of whom 19,299 worked underground. There is doubt as to whether the same classes of surface employees are included in these figures in the two cases, but this does not matter especially, since the most important comparison is the death rate of the underground men who surely do similar work. In the United Kingdom in 1896 the proportion of fatal accidents to the total number of employees was 1/710, which was somewhat larger than the rate of the

previous year and indeed larger than the general average for many years in the United Kingdom. In Colorado the proportion of fatal accidents to number of men engaged underground was 5/966. There being no statistics for previous years it cannot be said definitely whether this rate was above or below the normal. There is reason, however, for the belief that it was not the former, since there was no unusual catastrophe and most of the accidents happened to individuals, or pairs of men working together. The single accident by which a large number of men lost their lives was the caving in of the Anna Lee shaft at Cripple Creek whereby eight were killed. In the previous year six men were killed by the explosion at the Belgian mine at Leadville and 12 by the flooding of the Sleepy Hollow mine in Gilpin County. This certainly indicates that the accidents of 1896 were not abnormal.

The causes of the accidents during the 18 months from June 1st, 1895, to December 1st, 1896, are tabulated with much detail. The total number of persons killed was 154; 162 were injured more or less seriously. We confine ourselves in this discussion to the fatal accidents, since statistics based on these are the more reliable. The most frequent cause of fatal accidents was explosives, from which 45 deaths resulted. Of these six happened from premature blasts—that is to say, from the use of too short fuses; nine from picking out missed holes, the real cause being probably in most cases "slow fuse"; seven deaths resulted from drilling into or near unexploded cartridges; five from the use of metallic tamping bars; six while preparing charges; two from returning before all blasts had exploded; eight from unknown causes (including the six deaths at the Belgian mine); and six from thawing frozen powder.

There were 39 fatal accidents from falls of ground; 25 from men falling down shafts and winzes; 12 from being caught by cage and other machinery; 14 by drowning in a sudden influx of water from an adjoining mine (Sleepy Hollow accident); eight from a cave-in of shaft (Anna Lee); and 11 from miscellaneous causes, including two from underground electric wires, and four from bad air. Certain of the miscellaneous accidents should probably have been included under the caption of falls, while the cave-in of shaft properly belongs with the accidents due to fall of ground. These minor errors in classification do not, however, prejudice the conclusion which must be drawn from these statistics.

In the United Kingdom in 1896 the total number of fatal accidents underground was 33, of which 15 were due to falls of ground, and 11 to falls of men in shafts and winzes, the remaining seven being attributed to miscellaneous causes, none of which was traceable to explosives. In 1895, however, there were five deaths in the United Kingdom from the last cause.

On the face of these returns it is indicated that the great mortality in metal mining in Colorado is directly due to carelessness; either on the part of the sufferer or on that of his employer. A perusal of the accounts of the various accidents, which are given with interesting detail, leaves no doubt as to this. For sake of illustration a few of these may be mentioned. In the Bachelor mine, Ouray County, a man was taking down ore under loose ground, which the foreman considered dangerous and ordered him to remove. Returning from his rounds the foreman found that his order had not been obeyed and repeated it. The words were hardly out of his mouth before the rock fell, killing the miner and breaking the foreman's leg. At the Independence mine (Cripple Creek) five men were at work at the bottom of the shaft. The top-man neglected to close the doors over the shaft and dumped rock from the bucket into it. By great good luck none of the men in the bottom were injured, but one who was afterward descending on the bucket to learn if they had survived was struck by a piece of rock, that had lodged in the shaft, and it being then jarred loose, he was knocked by it from the bucket, fell 400 feet, and was killed. In the Gold Coin mine at Victor a man was killed by a rung pulling off the ladder on which he was ascending; investigation proved it had never been nailed at one end. Seven fatal and four non-fatal accidents is the record of men falling from buckets while being hoisted. In Colorado it is the custom in riding on the bucket to stand on the rim, holding the cable in the hands. One man doing this in the Forepaugh mine at Leadville let go the cable with both hands to reach the bell-rope, lost his balance, fell 100 ft. and was killed.

It is, however, in the use of explosives that the most carelessness is shown, and the character of these leaves one in doubt as to whether a large part of the men engaged in mining in Colorado ought to be entrusted with explosives at all. There were five fatal and seven non-fatal accidents from attempting to light too many blasts at one time, and therefore remaining too long after lighting the first one. The thawing of powder led to six fatal and five non-fatal accidents, and many of these were to men of long experience in mining. They had never, however, profited by the experience of others that the oven of a cooking stove is not a good place wherein to thaw frozen powder, and the personal experience came to several of them too late to be of use. In one instance the mine inspector found two boxes (100 pounds) of dynamite upon the back plate of a boiler, where it had been placed so as to keep good and

hot for use." The boxes were so hot that they could not be handled with naked hands. Immediately below it were 10 more boxes of dynamite. The order to remove this powder to a safer place was resented by the person in charge, who said he "had done that for four years and never had an explosion." Truly, there is a special providence which watches over some fools!

With the examples above noted it is not difficult to understand the excessive mortality in metal mining in Colorado. It is observable from the records that the more accidents occur in small mines, where discipline is apt to be lax, and in parts of old mines which are being operated by lessees under a system much in vogue in Colorado. It is very common there when a corporation can no longer make money out of a mine to turn it over to lessees, who generally work it at a profit. It is notorious that they are able to do this by taking risks with respect to supporting the ground and otherwise that the corporation cannot afford to do.

After carelessness the greatest number of accidents in Colorado metal mines may be traced probably to ignorance on the part of many who are called miners, but in reality have little knowledge of the work. A good miner is to a certain extent a skilled craftsman like the carpenter and smith; in European countries where underground work has been carried on many centuries, a man does not become a miner until he has served a long apprenticeship, and is ever under the close supervision of a master miner; in our own Western States, with characteristic American assurance, men fresh from the farm or the benches go to work in a mine and in a month or two call themselves miners, under which guise they may be employed elsewhere without oversight, and are a constant menace to the safety of all who are working with them.

There is every reason to believe that the fatality in Idaho, Montana, California and Utah mines is as high as that in Colorado, though none of these States publishes statistics bearing upon the subject, except Montana, and its compilations are too imperfect to permit reliable conclusions to be drawn from them. The facts, which are shown plainly by the Colorado statistics, however, are sufficiently grave to call for stringent State supervision of metal mining in so far as the safety of the men engaged in the industry is concerned.

NEW PUBLICATIONS.

GEOLOGICAL SURVEY OF NEW JERSEY: ANNUAL REPORT OF THE STATE GEOLOGIST FOR THE YEAR 1896. John C. Smock, State Geologist, Trenton, N. J.; State Printers. Pages, 380; with maps.

The Geological Survey of New Jersey has a high reputation for the excellent work which it has accomplished under the late Professor Cook and the present State Geologist; and its work has been further advanced than that of any other State Survey. At present a considerable part of its time is occupied in the study of the water-sheds and the water supply of the northern part of the State, and the forest survey of the southern section, though the survey and mapping of the surface formations are still carried on and a study of the crystalline rocks of the Highlands is in progress. The water question is one of great importance to a region containing so many cities and towns as the northern half of New Jersey, and the work of the Survey in this direction has been of much value. The Survey is also charged by law with the making of plans for draining swampy and overflowed tracts, at the request of owners of such lands. The largest work of this kind yet undertaken has been the draining of the Great Meadows in the Pequest Valley, which has been successfully accomplished. The drainage and reclamation of the wet lands in the upper valley of the Passaic is now in progress. An examination of the extensive tide marshes of the lower Hackensack, with a view to their reclamation, has also been made, though no systematic work has yet been undertaken as a result.

The volume for 1896, besides the general statement of progress, includes eight special reports. Three of these are on the work of surveying the surface formations—Surface Geology, by R. D. Salisbury and George N. Knapp; the Newark System, by Henry B. Kummel; and the Eruptive Rocks of Sussex County, by J. E. Wolff. Two of the reports are on questions connected with water supply, the first being on Artesian Wells, by Lewis Woolman, and the second on the Flood of 1896 in Northern New Jersey, by C. C. Vermeule. There are also reports on the Drainage of the Hackensack and Newark Tide Marshes; on Forestry, by John Gifford; and on the Iron Mining Industry, by George E. Jenkins. In the last-named report there are many interesting particulars in relation to the iron mines, which include some of the oldest mines in this country, and some which have been of great importance to the iron trade. In the last five years, however, only the old and larger mines have been operated, and no new mines have been opened, a result due to causes well known in the iron trade. The tendency has been to concentrate work, and the number of mines has decreased, while the output of the active mines has increased. The list contains such well-known producers as the Fellows, the Kishpaugh, the Ogden, the Hurd, the Richard, the Hibernia and the Ringwood. Outside of the iron mines the zinc mines at Franklin and Sterling Hill are the chief operations in the State.

The present volume shows that the Geological Survey of New Jersey continues to maintain the high standard set in its earlier work, and to be of much service to the State.

Quicksilver in New South Wales.—John Plummer reports that very large and rich deposits of mercury have been discovered on Noggriga Creek, New South Wales, by a party working under aid from the government prospecting vote. A 40-acre mineral lease has been secured by the party, who have sunk a shaft to a depth of 100 ft., at which depth the lode carries a high percentage of metal.

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.

Railway Track and Track Work. By E. E. Russell Tratman. New York: The Engineering News Publishing Company. 1897. Pages, 422, illustrated. Price, \$3.

Surveyors' Tables; Being the Tables from the Manual of Land Surveying. By F. Hodgman. Climax, Mich.; published by the author. 1897. Pages, 128. Price, \$1.50.

Does the Gold Dollar Appreciate? The Gold Standard Elucidated. By John Henry Piper. New York City: the American Economic Publishing Company. 1897. Pamphlet; pages, 72. Price, 25c.

A Catalogue of Minerals Alphabetically Arranged with their Chemical Composition and Synonyms. By Albert H. Chester. Third edition. New York; John Wiley & Sons; and London, Chapman & Hall, Limited. 1897. Pages, 56. Price, \$1.25.

CORRESPONDENCE.

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

The Blackfoot Indian Reservation.

Sir: I beg leave to call your attention to a misstatement in the mining news columns of the *Engineering and Mining Journal* of August 21st. In mentioning the approaching opening of the mineral portion of the Blackfoot Reservation, Montana, it states no person has more than equal rights with all who may enter the strip after approval and filing of maps. The act of Congress of June 10th, 1896, under which the mineral portions of the Montana reservations known as the Blackfoot and the Fort Belknap are to be open to entry, provides "that any person who in good faith prior to the passage of this act had discovered and opened, or located, a mine of coal or other mineral, shall have a preference right of purchase for 90 days from and after the official filing in the local land office of the approved plat of survey."

The government agent for the Blackfoot agency reported August 15th, 1894, that it was difficult to prevent intrusion in the mineral portion of that reservation; the Fort Belknap agent reported August 18th, 1894, that persons were clandestinely marking out mining claims all over the Little Rocky Mountains regardless of all reserved rights and the laws of the United States. It is probable every desirable lode will be located in "good faith" long before the strips are legally opened.

CHICAGO, Ill., August 31, 1897.

GILBERT G. OGDEN.

The Western Australian Mining Machinery Exhibition.

Sir: The proposal to hold a mining machinery exhibition, originated with the Mine Managers' Institute of Coolgardie, whose members were deeply impressed with the necessity that existed for some practical exposition of the working—under circumstances similar to those under which our mines have to be worked—of the many kinds of machinery, gold saving and amalgamating especially, brought under their notice. They fully recognized that there was only one means by which this was to be accomplished without causing serious loss both in time and money to companies, viz., by having a working exhibition on the fields. Hence the proposal and the means taken to bring it to fruition.

The movement is being carried out under patronage of the West Australian government, the government further assisting it both in lands and financially. It was at first intended to have the opening day October 1st, but the matter was taken up in such an earnest manner by British, Colonial and Continental manufacturers that the undertaking promised to be more extensive than was at first intended and necessitated a postponement to April, 1898, which means practically about May 1st.

I have written numerous American manufacturers, especially to the makers of wind-mills and rock drills, with a view of inducing them to be represented. For these classes of appliances there should be an immense demand here presently, since almost entirely the water required has to be raised from shafts, and up to the present time only about half a dozen companies have rock drills in use. As regards gold-saving machinery the West Australian fields offer exceptional opportunities to manufacturers, as in addition to our low-grade ores our richest stone carries a very large percentage of fine gold which it is impossible to save by ordinary appliances. Moreover, water is in almost every case densely salt—in some cases more so than ordinary sea water—consequently more gold is lost in tailings on this account. The discovery and general adoption of appliances or methods for saving fine gold is of the utmost importance to us; it is perhaps the greatest question of the day so far as these fields are concerned, and offers unlimited scope for enterprising manufacturers and patentees of this class of machinery. Our mining men are not prejudiced, are not confined to Colonial or English manufacturers, but want only the opportunity of choosing the very best possible.

It is expected that the exhibition will be kept open for about six months; it will certainly extend over three months. The government of Western Australia imposes no duty on mining machinery. As is usual for the protection of exhibitors of dutiable goods the exhibition will be proclaimed a bonded store. We have not as yet appointed receiving agents at Albany and Fremantle, but the names of these as well as a printed copy of conditions I shall send you later.

COOLGARDIE, W. A., July 12, 1897.

GEORGE WILLIAMS, Secretary.

Native Arsenic.—Native arsenic of superior quality is reported to have been discovered in several of the deep levels of the Kapunga mine in New Zealand. The find is said to be a valuable one.

MINING IN THE DEPARTMENT OF ANCACHS, PERU.

Written for the Engineering and Mining Journal by F. J. Schafer.

Starting from the port of Chimbote, or the mouth of the River Santa, the first mining establishment met with is the smelting plant erected by the Patara Mining Company, Limited, at Pampa del Mirador, about 45 miles from Chimbote, on the left bank of the Santa River.

This plant was established in order to treat the lead ores from the Patara mines, chiefly the Mataburras mine, situated at Patara 15,600 ft. above sea level and at a distance of 26 miles from the works. The location of the machinery at Mirador was mainly due to the fact that the Chimbote & Huaraz Railroad passed there and cheap and good coke for smelting could be obtained.

The railway, however, shortly afterward went to complete destruction and the plant at Mirador was consequently abandoned. From 1876 to 1895 the mines at Patara were worked for export or shipping ore only.

In order to transport the ore from the mines to Mirador a fine cart road was built from Patara on a 10% grade, at a cost of \$22,000, the ore being taken from the mine to a station on the cart roads by llamas, then by cart to Mirador, and then by mules to Suchiman, whence the railway is still operated to Chimbote, a distance of about 35 miles.

After 1890 it was found that to work the mines only on export ore was no longer profitable, and the company leased its property to Messrs. C. W. Schröder, of Lima, and Henry W. Gibson, of Arequipa, who in 1895 called upon their manager, F. J. Schafer, to erect a lixiviation and concentration plant to treat the lower grade ores. This plant is now running with a monthly production of 1,500 marcs of silver, or \$7,500, the total expenses being about \$3,000 per month.

Macate Mining Company, Limited.—The next mines of importance are those of the Macate Mining Company, situated about 12 miles further up the Santa River from Pampa del Mirador. They are gold mines which have been worked since 1889. The mill plant is situated at La Soledad, on the banks of the river, while the mines are about 7,000 feet higher. The ore is brought to the mill by a four-wire ropeway, said by Messrs. Fraser & Chalmers to be the finest piece of aerial tramway constructed by them.

The ores carry from 1½ to 2 ounces of gold per ton. The mill consists of two 5-stamp batteries and two No. 3 Huntington mills, all by Fraser & Chalmers. The capacity of the mill is about 600 tons per month. Owing to the refractory character of the ore and the management insisting upon the employment of amalgamation only no dividends on the capital of £80,000 have yet been declared.

The Calluash Gold Mines Company.—Ten miles higher up the Santa River from La Soledad some very wide quartz veins were discovered by Messrs. Montgomery, Backus and Schafer in 1895. The late Montgomery Backus, an American from Detroit, was one of Henry Meiggs' chief engineers on the Chimbote, Huaraz & Arago Railroads. This discovery led to the formation of a small syndicate in Lima with a capital of £5,000; with this money a ditch was built for a distance of five miles through very rough country to bring water to the mines and mill, a fall of 1,200 ft. being obtained; with the water available under a head of 400 ft. a No. 5 Pelton motor will develop enough power for a complete 5-stamp mill.

The stamp mill, rock breakers, etc., have been bought and are partly on the site, the ditch, houses, etc., are ready, pasture land has been purchased and the mines partly developed. All this has been done for £5,000. Owing to differences of opinion among the company, however, the mine is now closed down.

Calluash is without doubt a valuable property, but needs more capital and much more enterprise. Many samples broken from the surface gave 2, 5 and 8 oz. of gold per ton. I believe that 20 tons of ore assaying 2 oz. per ton can be extracted per day; how much of this gold can be saved by amalgamation is a subject for tests.

Caráz, Huaraz and Recuay.—The next mines of importance are at Caráz, Huaraz and Recuay, all situated higher up on the Santa River. At Caráz some considerable fortunes have been made in shipping ores only. Two lixiviation plants have been recently constructed at Caráz to buy and treat the low-grade ores, *i. e.*, 20 to 40 marcs per cajon, or 53 to 106 oz. per ton. One of these plants, that of Señor Carlos Pierola, has a capacity of three tons per day, no foreign machinery except one Douglas pump being used. The other has a capacity of nine tons, most of the machinery (made in Lima) being of inferior quality and managed by a "muscular lixiviator" who already finds his rule of thumb methods too much out of date even for so rich a mineral country as Peru.

Ticapampa.—At Ticapampa, about one mile from Recuay, a French company is working 10 tons of 100-oz. ore daily by pan amalgamation. The crushing machinery consists of rock breakers and rolls, all French with the exception of a ball mill, which is German made (by Messrs. Krupp). This company has been running very successfully for 10 years.

Parco.—A German syndicate has erected a 6-ton lixiviation plant here, about three miles higher up and near the source of the Santa. The ore treated assays 80 to 100 oz. per ton. All the machinery, consisting of ball mill and rock breakers, is of German make.

Farica.—A small but well organized smeltery has been successfully running for about seven years under the able management of the well-known Mr. Wertheman.

Conchucos, on the eastern slope of the white Cordillera, a mining district but little known, is bound to very soon draw attention. It can be truly said to be the richest silver, gold and copper mining district in the whole department of Ancachs, besides being favored with all the necessary facilities for development, as water power, fuel (coal and wood) in abundance, plentiful, cheap and good labor, cheap provisions and exceptionally abundant high-grade ores.

During the last five years three foreigners operating there have made considerable fortunes on shipping ore only. Ore assaying from 70 to 400 marcs per cajon or 180 to 1,000 oz. of silver, is being regularly shipped, and strange to say they are the only men, native or foreign, who operate there. All ore under 150 oz. per ton is left on the dumps.

It is possible to extract from some of the immense veins cropping out from 5 to 8 tons per day of ore assaying 80 to 100 oz. silver, ½ to 2 oz. gold

and 8 to 10% copper. The gangue is quartz, and no better ore for lixiviation can be imagined.

There are numerous and wide veins which can be had for the mere expense of denouncing and taking possession and paying the yearly tax of \$15. It would be, however, impracticable to put up a plant of a capacity of more than six tons per day, but on a daily output of six tons over \$9,000 per month can be produced and this on a capital of \$150,000 at the very outside. The monthly expenses, taking Patara, Ticapampa, Pasco and other running concerns as a basis, would not exceed \$3,000 per month, leaving a profit of \$72,000 per year. I may add that none of the works mentioned cost \$50,000, nor has \$50,000 even been spent in developing the mines connected with them. The motive power would have to be Pelton wheels and the crushing machinery light rolls or ball mills.

MINING CONDITIONS IN ANCACHS.

The capacity of all the silver mills now in operation in Ancachs is small, from 6 to 15 tons per day. It is almost impossible to work on a larger scale. (1.) Because the owners refuse to develop their mines on anything but a very small scale. Ore averaging from 60 to 150 oz. per ton is abundant and 10 to 15 tons per day can be had by gophering on the surface in an inexpensive manner. (2.) Because the mines generally lie high up, and in order to get the necessary power the plant has to be built at the foot of a *quebrada*, or valley, which necessitates transport by donkeys and mules; in order to keep, for instance, the Patara plant supplied with six tons of ore per day and the necessary coal, etc., 257 donkeys are needed daily, meaning a total of more than 500 donkeys since they cannot work more than half time. This latter difficulty can be remedied, however, by applying capital in wire ropeways, tracks, and good roads and chutes.

Machinery.—It is remarkable that in Lima there is not a single representative of American mining machinery, whereas the German house of C. M. Schröder & Company, represent Krupp, Koppel, Grusonwerk, Helios, and numerous other German firms. They have on stock and afloat over \$100,000 in rails and cars, sugar plantations, electric-light plant, mining machinery of all kinds and do a big business. German machinery is forced upon us and we have to take it whether we want it or not. I ordered Fraser & Chalmers machinery for the Patara mill, but I was obliged to use German and with what disastrous results I will explain in a subsequent article.

Agents.—It is to be hoped that if American or English capitalists invest in Peru they will be careful in choosing their agents. Everything has to be done via Lima, Callao or Arequipa. There are some honest houses in Lima, but many consider a foreign mining company legitimate prey.

Labor.—Most companies insist upon sending out high-priced engineers, and mechanics and in many cases drill men also. This is absolutely unnecessary. There are in this country native and foreign mechanics, etc., well used to the climate and customs, whose work is just as good as that of those generally sent from home. As to miners the Peruvian compares very favorably with the miner of Colorado, Montana or New Mexico. I have worked in all these States and have found, although the labor is undoubtedly good, a drillman earning \$2.50 to \$3 in New Mexico does very little more work than the "cholo barretero" who earns his one sol or 50c. gold per day. Besides this he knows nothing of trade unions nor eight-hour shifts. The native will work 10 to 12 hours without grumbling and take 75% of his wages from the company's store on which from 35 to 50% profit is made. The "capachen" or car boy earns 30c. to 50c., which equals 15c. to 25c. gold per day.

Living.—In Caráz, Huaraz, etc., one could starve were it not for the same bland old Chinese one meets at Aspen, El Paso and Santa Fe, but he supplies good food at 15 soles, or \$7.50 gold per month.

GENERAL REMARKS ON ANCACHS.

Silver Mining.—It will be seen that considerable work is being done in this department, but not a single American company is operating, and very little American machinery is seen except at the Macate Mining Company's plant, and the abandoned works of Parco.

As far as silver mining is concerned a large field exists for well organized lixiviation and concentration works, especially in Conchucos, where 100 oz. ore and ample water and fuel can be obtained.

Silver mining in this department is preferable to gold mining, because the silver ores are abundant and machinery for their treatment is easily transported. Freight from coast to Conchucos cost 3 soles per 100 lbs., or \$30 per ton, and \$6 per ton from New York to port.

Gold Mining.—From Chimbote to Caráz numerous quartz veins are to be seen, the only ones as yet developed being those of the Macate Mining Company, and of the Calluash Gold Mines Company.

On the river Chuquicara, at the junction of the Chuquicara and Santa rivers, from 100 to 150 Indians can now be seen, during the dry season, when the river is low (from May until November), washing the river sand over sheepskins with extraordinary results.

A well organized prospecting party led by a man knowing the country, could not fail to secure valuable property, by examining the head waters and part of the department of Patas. This district is preferable to Sandia, on account of the climate and the absence of the enormous transport difficulties of Carabaya-Sandia.

Huntingdon mills are preferable to stamp mills, on most veins examined by me, but before ordering machinery, very careful tests should always be made on the character of the ore, which in most cases, especially in the Cordillera negra is very deceptive. For instance, ore giving three ounces by fire assay gave 1.2 ounces by amalgamation test only and concentrated on an ordinary bumping table gave 2.80 ounces in concentrates assaying 33 ounces per ton. There are, however, also numerous free milling ores to be found.

Tin Mining in France.—In the *Annales des Mines* P. L. Burthe gives an account of the explorations carried out at the Meymac tin mines. The deposits were discovered in 1867 in an outcrop of white quartz in the granite of the Gardes Mountains. On sinking a shaft a single crystal of cassiterite was found. This was the first indication of the existence of a tin deposit. The works were suspended in 1883, but in 1891 fresh explorations were undertaken.

THE FAYAL IRON MINE ON THE MESABI RANGE.

By F. W. Denton.

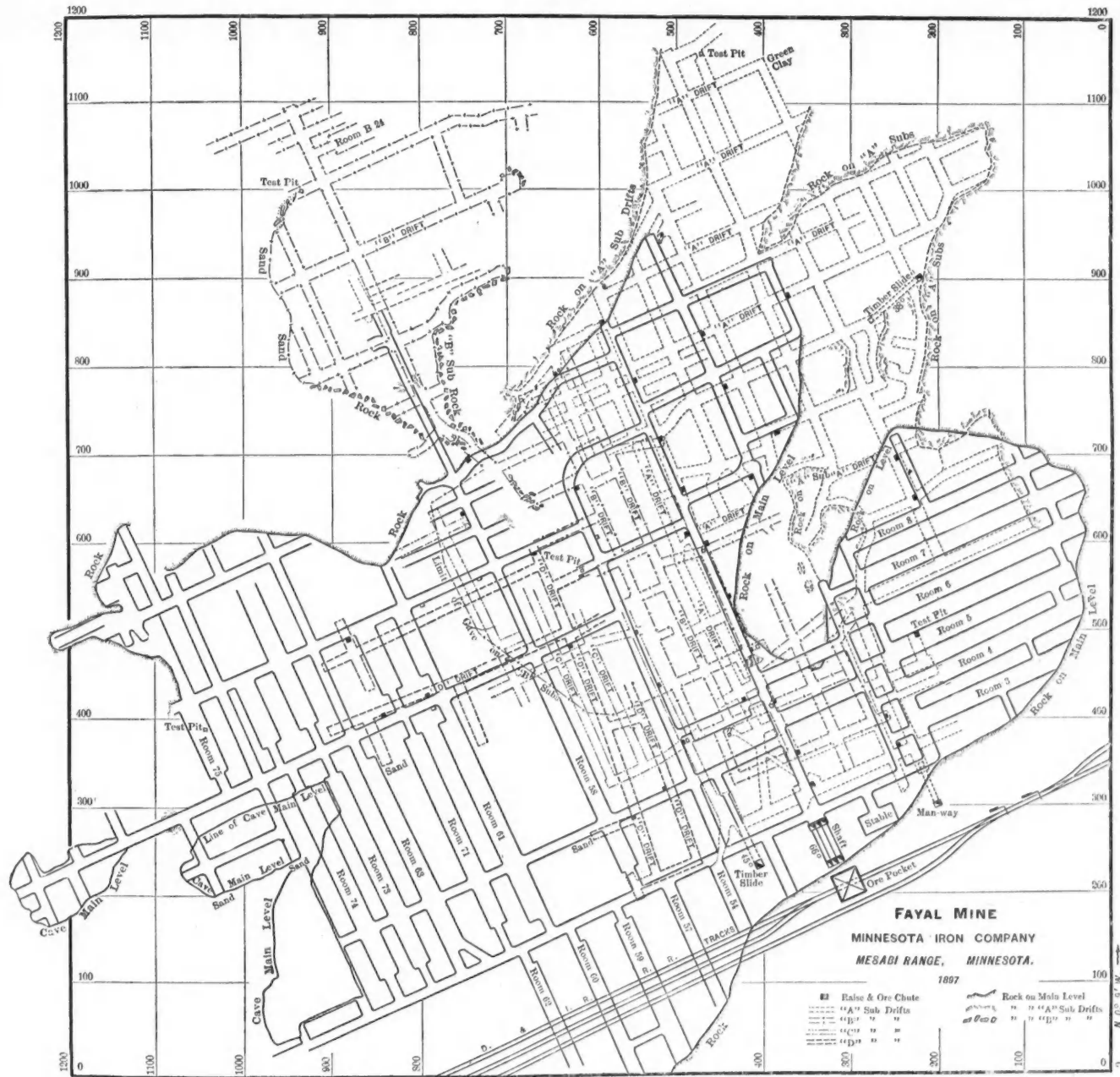
In a paper read before the American Institute of Mining Engineers, Professor Denton says that the Fayal mine, belonging to the Minnesota Iron Company, is the most extensively developed of the purely underground mines on the Mesabi Range. Fig. 1 is a plan of the workings. It is doubtful if a more carefully and accurately laid-out iron mine of equal size is to be found anywhere. The large area of developed ore is shown on the map; and there is another area, at least equally large, on the 40 acres adjoining to the south, which is about to be developed. The Fayal shaft was sunk in the winter of 1894-95; in 1895 there were

into rock or the overlying sand, a second series of subs known as B-subs is run 12 ft. lower, center to center, than the A-subs. The C and D-subs follow in order.

One series of subs is not extended under the one above, as a rule, until the upper one has been worked out; and when necessary, in order to reach timber or ore-chutes, the drifts are staggered so that the roof of the lower drift does not come entirely under the floor of the upper drift.

After blocking out the ore by these drifts, the pillars or blocks are mined by slicing and caving; that is, a drift will be run along the further side of a pillar; then this drift will be caved and a second slice taken off alongside the first, and the operation will be repeated until the block has been mined. Each slicing drift is not run entirely across the block, but two drifts are started, one from each side, to meet half way down the side of the block.

FIG. 1.



mined 125,000 tons of ore, and in 1896, 325,000 tons. All the ore is made into one grade, containing 62.5% of iron and 0.038% of phosphorus.

There is from 65 to 90 ft. of surface over the ore. The top of the ore slopes south. The method of mining has been by rooms, and by top-drifting and caving. The rooms are made about 24 ft. wide, with pillars between of about the same width, or a little less. The rooms are carried up to the overlying sand, which may make them as high as 65 ft.; the length may reach 300 ft. All rooms are filled after they are completed by running in glacial drift, which forms the roof, through a raise put through to the surface for the purpose.

When rooming is not employed, raises are put up to the sand, and from the tops of these raises, what are called sub-drifts are put through the ore, dividing it into a series of blocks or pillars, one drift-set high (see Fig. 1). These subs are timbered with drift-sets. The first series of sub-drifts, just under the sand, are known as A-subs. When the A-subs run

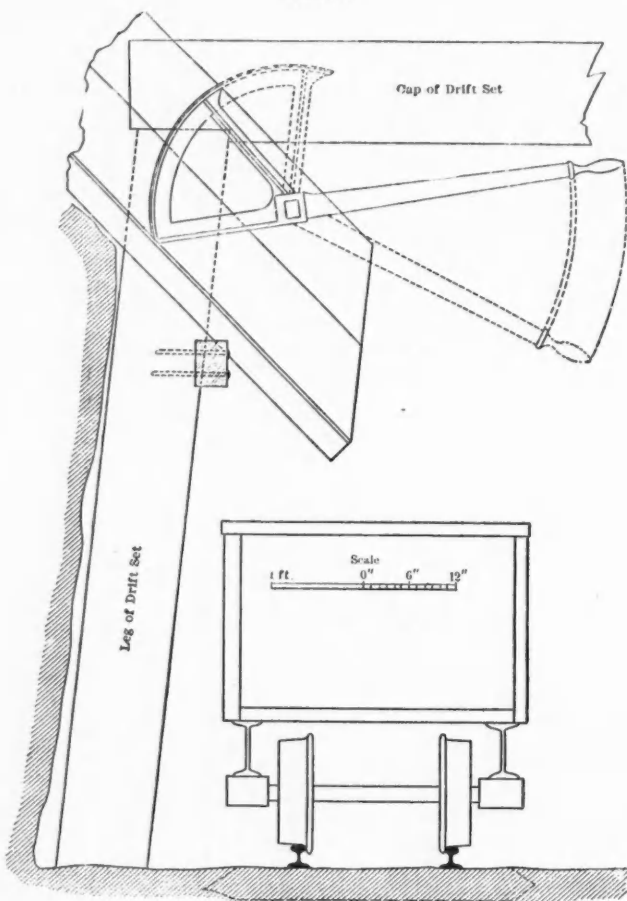
Before caving these slicing drifts, 1-in. boards of the cheapest grade obtainable are placed over the bottom of the drift to keep the sand from mixing with the ore mined from the next lower series of drifts. The raises used for ore-chutes are placed about 100 ft. apart; and thus far regular mine cars running on tracks have been used in the sub-drifts. Fig. 2 shows the standard underground chute, car, etc.

The first main sub-drift timber sets are made of 12-ft. caps and 8-ft. legs, making 10 x 8 ft. in the clear; and the sets used in slicing have 8-ft. caps and legs 8 ft. 8 in., making 7 ft. 6 in. x 8 ft. in the clear. The top of the ore is irregular, a condition which often leaves bunches of ore above the top subs. This ore is obtained during the slicing and caving by raising above the drift sets and, if necessary, putting in "baby-sets." When the next lower drifts are run under the caved ground, all of the 12 ft. of ore is removed, as follows: The legs being 8 ft. long, the caps 1 ft. in diameter and the lagging 6 to 8 in. thick, a total excavation

of about 10 ft. is required to make room for the sets, and the space remaining between the top of the lagging and the planking above is filled with blocking, the planks being allowed to settle as little as possible.

At first the rooms were carried up by overhand stoping, with the aid of square-set timbering, in the usual manner; the square sets being 7 ft. 6 in. from center to center of legs, and the rooms therefore three sets wide. Recently, however, the experiment has been tried of putting in what are termed at the mine "stull-rooms." Fig. 3 shows the form of these rooms. The top of the room is first cut out by driving a wide drift just under the sand, and supporting this drift with saddle-back timbering, which becomes the roof of the room. This roof timber is put in by driving from sub-drifts on the same level to avoid the hoisting of timbers. The rooms could be started from the tops of raises if necessary. After the roof is thus securely supported the ore is stoped under-hand, through the raises, to the drift in the center of the bottom of the room, where it is run into cars and trammed to the shaft. The sides of the room are left unsupported. It was doubtful whether these sides would stand, but a number of rooms have already been mined in this way without any trouble. Many of the Mesabi deposits, however, are traversed by a series of parallel and almost vertical fissures or seams filled with crushed quartz, which, while less than 1 in. thick, as a rule, would seriously interfere with this method. The Fayal has none of these seams, at least where the saddle-back rooms have been made, and no trouble has arisen from caving sides. The ore obtained from these rooms is probably the cheapest ore obtained underground on the Mesabi, as the advantage of easy breaking is obtained with a low timber cost.

FIG. 2.



STANDARD UNDERGROUND CHUTE USED IN THE FAYAL MINE.

The shaft is sunk in ore as close to the rock as may be, in order to lock up as little ore as possible in pillars. A plan of the shaft is given in Fig. 4. It is sunk at an angle of 66° with the horizontal, which angle does not require that back stringers be used to keep the skips on the track. A section of the shaft and underground pocket together are shown in Fig. 5, and no special description is needed. These pockets are being generally adopted, and make tramping and hoisting independent of each other for a short time.

The tramping is done by hand in the sub-drifts, but for long tramping on the main levels mules are used, and have been found to reduce the cost materially. The V shaped hopper cars used with mules are run over the pockets and the doors are released and closed automatically. The hand cars hold about 1½ tons and the mule cars about 2 tons each. The skips hold 3½ tons each. The wheels are made of manganese steel. The skips are operated in balance, and as the shaft is used for hoisting only, its capacity is very large. An average output of 50,000 tons a month could probably be maintained at this shaft.

The Fayal shaft being an upcast, the head frame is boarded in to keep water from freezing on the rails and skip. The top of the Fayal pocket is 40 ft., and the head-sheave axis 65 ft. above the ground. The main timbers are 12 by 12 in. The maximum height of the stock-pile is therefore 40 ft. At other shafts of the Minnesota Iron Company the height of pockets is about 34 ft.

The stock-piles are made long and narrow, and are built up by dumping over the end, and not over the sides, as by so doing the pile increases too fast to freeze hard. Stock-piles that have frozen during the winter cause a good deal of trouble in loading by steam-shovel in the summer. The hoisting plant has two 18 x 42 in. cylinders, operated by Corliss valves without cut-offs, which are directly connected to a 6-ft. drum, fast upon the shaft. The plant was made by the E. P. Allis Company. The hoisting rope is a 1-in. lang-lay rope, made by Roebling.

A special feature of the Fayal mine is the use of timber-slides for getting timber into the mine. These slides are made by putting up raises to the surface, 5 x 5 ft. in section, and equipping them with skid-ways, down which the timber is allowed to slide. The skid-ways are curved at the bottom, to diminish the velocity of the timber. The angle of the first slide was 45°; but the latter ones were put at 38°, which is considered to be about the best angle. The men are required to travel in and out of the mine through inclined raises specially prepared for them.

THE MINERAL BELT OF THE MOGOLLON RANGE.

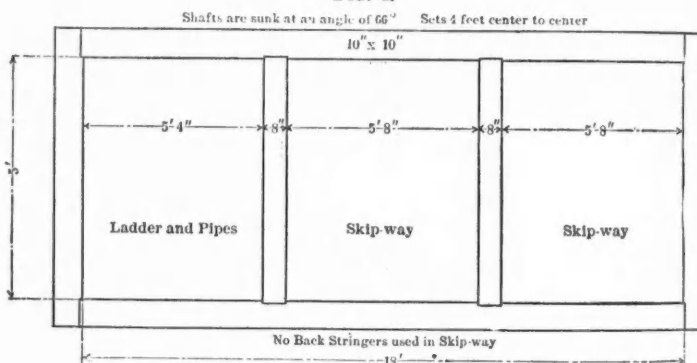
Written for the Engineering and Mining Journal by Carl Andersen.

The Mogollon Range of mountains in New Mexico is bounded on the north by Nutro-a Creek, a tributary of the Rio San Francisco and on the south by the Gila River. The general direction of the range is northwest and southeast. The main part of the range is situated in the southwest corner of Socorro County. The crest reaches an altitude of 6,000 to 7,000 ft. above the valley, or of from 11,000 to 12,000 ft. above sea level.

The main mass of the Mogollon Range is built up of successive sheets of volcanic rock of various thickness and composition; on the west side of the range these sheets have a gentle pitch toward the southwest. No sedimentary rocks have been found, and if any existed they have been so altered and metamorphosed as to obliterate all their original characteristics. The sheets of volcanic rock vary greatly in composition, texture, etc.

There are, however, two predominating groups or classes; one is a light-colored felspathic rock with a predominance of quartz, in places resembling pitchstone trachyte, in other places quartz trachyte.

FIG. 4.



PLAN OF THE FAYAL SHAFT.

These rocks which form the upper strata of the mountains have been subjected to erosion and are now mainly found capping the foothills. The rock has a perpendicular columnar structure. Underlying this stratum are thinner layers of quartz porphyries, with horizontal cleavage, varying from microcrystalline, rather basic porphyries to coarsely crystalline quartz porphyries. Some of these layers, evidently intruded between thicker layers, wedging out on both sides, resemble thinly beaded sandstone, but close examination proves them to be of volcanic origin.

Overflowing, intruded and underlying these rocks are sheets and dikes of the other characteristic rock, and andesite or andesitic breccia, in places altered to a propylite. The west flank of the Mogollon Range is extensively faulted, as a result of strong volcanic actions, followed by flows of the andesite, and along this line of disturbance the mineral is found.

The mineral belt extends northwest and southeast at least 25 miles, or in fact as far as careful prospecting has taken place, with an average width of about 1½ miles, following closely the foothills on the western slope of the Mogollon Range. The region is mountainous and deep-cut gulches and steep slopes prevail. The summits along the west side of the mineral belt are rugged and precipitous.

Beginning at the northwest end of the mineral belt with silver and copper ores, there is a gradual change through silver and gold veins at Mogollon, free-milling gold ore at Little Whit-water, pyritic gold ores at Dry Creek to telluride gold ores at Little Dry Creek in the south end of the mineral belt. This gradual change may perhaps be explained by the westerly dip of the mountain strata.

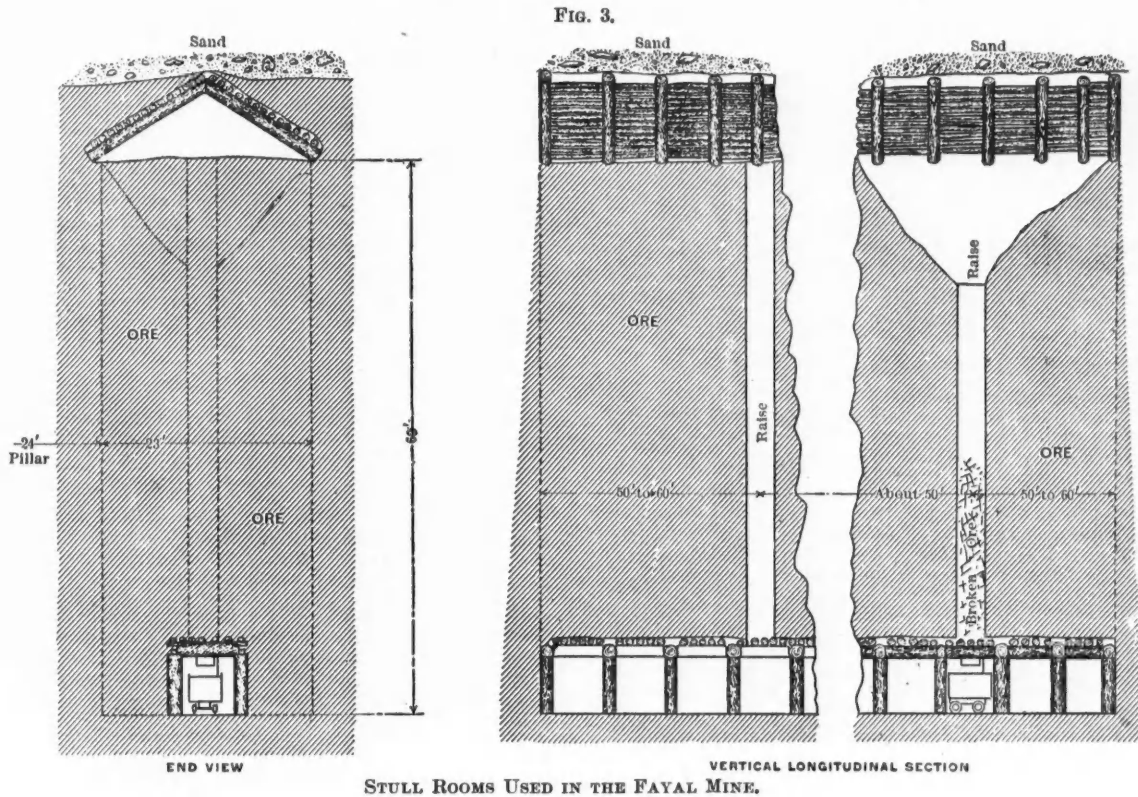
The area within the limits of the mineral belt has been extensively faulted; in many cases this faulting has taken place along pre-existing fissures, formed along crests of anticlines. The faulting has in a number of cases been caused by an intrusive porphyry, the above-mentioned andesite. The throw of the faults varies from zero to several hundred feet. The strain in the upper and more brittle strata close to these faults has caused lines of crushed rock or "sheared zones" parallel with the line of fault.

So far the best-known and most-developed part of this mineral belt is known as the Cooney Mining District. Here are found all the different characters of fissures.

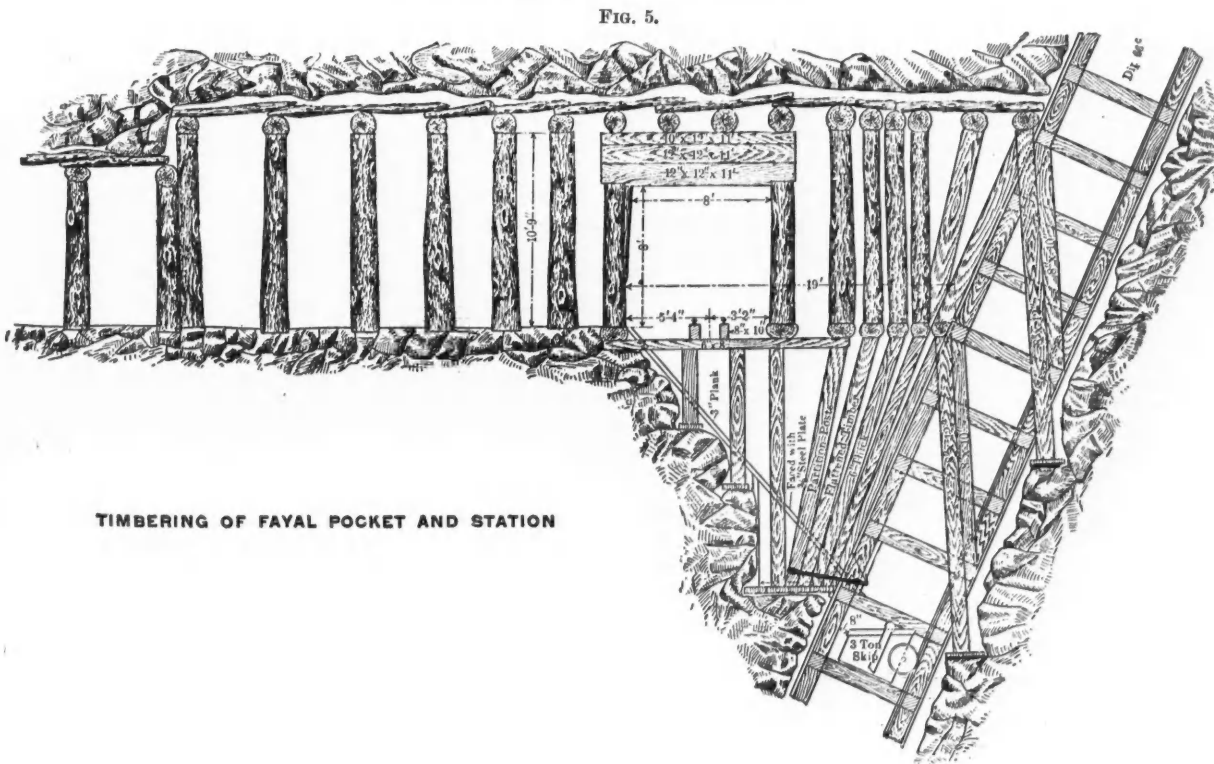
The strongest and most continuous vein of the mineral belt is known

as the Queen vein. It is a true fissure vein, running north and south, formed along the crest of an anticline, located for about seven miles. The structure of this vein represents an excellent example of a banded vein. The vein filling is a case of replacement, while small angular fragments in this vein would indicate secondary movements. The walls are well defined.

As the vein continues south it becomes more ferruginous, and after crossing the Whitewater divide the vein matter is a honeycombed quartz carrying a great amount of limonite and hematite. Here over half the value of ore is in gold. The iron has probably been derived from the pyroxene in the andesite, which is here greatly decomposed. While the vein is mineralized all through, the ore occurs in shoots. The best part of the vein is from Silver Creek, going north for about two miles. Considering the length and width of this vein but little has been done



STULL ROOMS USED IN THE FAYAL MINE.



TIMBERING OF FAYAL POCKET AND STATION

mostly with the quartz in parallel well-defined streaks, often only $\frac{1}{2}$ of an inch apart. This fissure forms the eastern limit of the disturbed area and probably also of the mineral belt, since no ore of any economic value has so far been found east of the Queen vein.

The vein varies greatly in width, but will average over 12 ft. As accessory minerals manganese, iron pyrites and copper carbonates are found. In this, as in all other free-milling veins in the district, a trace of copper carbonate is always found in rich ore.

to determine its value; but with a few exceptions, the claims will in all probability be found too low grade to handle. Large bodies of \$6 to \$8 ore are found along the vein, but such a grade of ore could not be handled at a profit.

Returning now to the north end of the mineral belt, we find fissure veins in a dark basic porphyry, mainly on the divide between Copper Creek and Mineral Creek, crossing the country in every direction, but as far as the stronger veins are concerned with a general northwest strike.

The vein matter is quartz carrying iron pyrites, chalcopyrite, bornite, tetrahedrite and the different oxides and carbonates of copper and iron. The copper ores are found to carry mainly silver, the iron ore the gold; the silver, however, predominates.

The occurrence of ore is very irregular. These veins were the first to call attention to the district, but with one exception, they have not been found remunerative. On the Silver Bar mine, a big pocket was struck near the surface, from which about \$350,000 was extracted. Development work so far has proved the continuance of the veins in depth, but the ore became baser and lower grade in silver and gold, and the mine has not been worked, as the profits were too small to justify the extraction of the ore. The solid mineral in the bottom workings is found to carry about 0.3 oz. of gold, 40 oz. of silver, 20% copper and considerable iron. The copper occurs mainly as tetrahedrite.

South of Mineral Creek, on the slopes of Silver Creek, are three east and west fissures, formed along three parallel faults. These three faults are parts of concentric rings, the center of which is an old crater south of the Last Chance vein, from which the late flows of andesitic breccia and andesite came.

The extent of the faulting was limited on the east by the Queen vein, from which may be concluded that the Queen fissure was already in existence, and seems to have assisted in the faulting; consequently we find the east and west veins gradually turning south and disappearing in the Queen vein.

There can be no doubt that the width and value of the vein matter in these veins is somewhat in proportion to the proximity to the Queen vein, and consequently to the throw of the fault. In only one of these veins, the Last Chance, is the banded structure characteristic of the Queen vein found.

As a result of faulting and erosion, these veins have then the appearance of contact fissure veins, with quartz trachyte as footwall and andesite as hanging wall. The faults are normal faults, that is, the downthrow is on the side of the dip of the fault.

Going west, the Last Chance vein crosses a vein, the Great Western, formed along a north-south fault, parallel with the Queen vein. That this Great Western vein is of older origin than the so-called contact is proved by the fact that where the Last Chance vein crosses the Great Western vein, the latter is found in the footwall of the former, well defined and intact, while no trace is to be found on the hanging wall side, as the hanging wall consists of later flows of andesite. Hence the Great Western vein will probably first be found on hanging wall at a great depth, corresponding to the throw of the fault. The crossing is found in the Confidence mine.

In the Maud S. mine, at a depth of about 400 ft. below croppings, the quartz trachyte was found to lie conformably on a different porphyry. Furthermore, in the lowest workings of the same mine, a trachyte is found to form the hanging wall. The writer has not been able to determine the amount of throw here, but it exceeds 400 ft.

The vein matter in these east-west veins is quartz, calcite and clay, carrying argentite and gold in proportion 2 to 1. The sulphide occurs in blotches in the quartz, and the vein does not exhibit a banded structure. On these veins are excellent properties, like the Little Fanny, Maud S., Last Chance and Confidence. In these mines the ore occurs in shoots, from 300 to 500 ft. in length, and from 4 to 10 ft. wide, averaging from \$12 to \$18 per ton.

The Great Western vein, mentioned above, with its spurs and cross-veins, has a north-south trend. The vein is formed along a fault, the throw varying from zero to about 200 ft., the east side hanging wall having slipped down. Of this system the main vein is the least important. Considerable work has been done and some small pockets and stringers of high-grade ore have been struck, but so far no extensive ore shoots have been encountered. The vein matter is quartz, with sulphide and chloride of silver and hematite carrying gold. The high-grade ore is generally found in a soft shaly quartz. From one-third to two-thirds of its value is gold.

The ore consists of brecciated or shattered country rock, impregnated, coated and replaced by quartz, often associated with calcspar and carrying hematite.

To the Great Western system of veins must furthermore be counted a strong vein formed along a fault, crossing the Great Western and running north northwest. On it are several promising locations, among which the Florida is showing up well.

Continuing south from White-water Creek, no mineral of any practical value has as yet been discovered until we enter Little White-water about eight miles south of the camp of Megolton. Here are found the same porphyries as at the north end of the mineral belt; but the strata are more folded, and the faults rather due to folding than to intrusive porphyries. The veins are also different and are examples of replacement along lines of weakness rather than filling of pre-existing fissures. The vein matter is quartz, fluorite and barite with hematite carrying gold and no silver.

This district was first discovered in 1896, so that nothing definite can as yet be said in regard to its future. However, the veins are quite well defined, and high-grade ore has been found along the croppings. The ore is entirely free milling.

Continuing south over an area of 12 miles in length by two miles in width, we find scattered locations on a well-defined quartz vein, mainly formed along faults with a northerly strike. The area has been but little prospected, and where locations have been made, with few exceptions, nothing but annual assessment work has been done. Several veins have been located on the slopes of Dry Creek which assay well, the value being entirely in gold and the ores mostly free milling, though some iron pyrites is found carrying gold.

South of Dry Creek, on the divide between Little Dry Creek and Pine Creek, a curious deposit has been somewhat developed during the last two years. The ore is a telluride of gold, bismuth and antimony and assays as high as \$4,000 in gold have been obtained from selected pieces. The ore is pockety and found along a dike of silicified country rock. The showings along the croppings are very fine; in one place high-grade ore shows continually for about 150 ft. Here a shaft is being sunk and is now down about 100 ft. The rock is greatly shattered in the shaft, but the ore has continued in small pockets.

This deposit probably occupies the neck and basin of an old crater. Within an area of 150 ft. square, the writer found five small geyser necks about 2 ft. in diameter, lined with quartz crystals; around this came a shell of flinty quartz carrying ore and round this again, a rock with the appearance of sandstone, with a horizontal cleavage, carrying the mineral in horizontal, parallel bands. Both the ore and tale have the appearance of sedimentary deposit. The necks dip toward each other and probably unite. A couple of tons of ore have been shipped assaying high.

No similar deposits have been found in this vicinity. The country is crossed by veins heavily ironstained and carrying a small amount of gold. No work has been done on them, but development may possibly prove them of value.

LIMITATION OF THE CYANIDE PROCESS.*

By Philip Argall.

The cyanide process, while generally applicable to oxidized ores containing fine gold, is quite unsuitable to such ores if the gold occurs partly in a coarse state, unless the cyanide is preceded or followed by amalgamation. It may also be broadly stated that copper ores are unsuitable for cyanide treatment, even with dilute solutions. I am aware that the statement has been made that dilute solutions have no effect on copper sulphides. Practical experience, however, does not confirm this statement. Copper invariably passes into solution and accumulates until it becomes of such strength as to be precipitated on the zinc in the boxes.

The experiments of Mr. Skey, of New Zealand, in this direction are to the point. Chalcopyrite and copper glance were taken by Mr. Skey, crushed, thoroughly washed and afterward placed in a 0.03% cyanide solution for one hour. The solution being then tested a perceptible quantity of copper cyanide, traces of sulphur and oxidized sulphur compounds were found in it. Sulphide of antimony is another objectionable mineral often stated to be quite unaffected by cyanide solutions, though as a matter of fact it is quite soluble. It is probable that in the foregoing copper and antimonial minerals part of the sulphur combined with the potassium, forming potassium sulphide that may possibly coat the gold with a sulphide film which protects it more or less from the solvent action of the cyanide. In this connection an experiment by Skey is suggestive. He found that a 1% solution of pure cyanide dissolved a given weight of gold in 10 minutes, but on the addition of 1-100,000 part of sulphur (as a sulphide) to 1% solution of cyanide, it required two hours to dissolve the same weight of gold. While fully admitting the deleterious qualities of alkaline sulphides, I must state that I have not found such minute quantities to be of serious moment in the practical application of the cyanide process. When the sulphur of a soluble mineral combines with the cyanogen it does not interfere with the solution of the gold, and very probably for this reason. Galena, though soluble, is usually quite amenable to cyanide treatment. Zinc blende and pyrites are practically insoluble in cyanide solutions.

In making extraction tests on ores it is important to note that an abnormal consumption of cyanide is invariably associated with a low extraction of precious metals. This consumption may be due to free acid in the ore, acid or basic salts, or ores easily soluble in the solution. The cause should at once be investigated and the evil corrected as far as possible before proceeding with the test. Cyanide of potassium, though a most active chemical, is easily broken up by acids, base metals and organic matter, forming numerous perplexing compounds while in contact with the ore changes and in passing through the precipitation boxes. It is doubtful if the complete chemistry of these changes is fully understood even by those who have made it a careful study.

The Belgian Coal Trade.—The Belgian imports of coal during the first half of 1897 were 847,404 metric tons, an increase of 72,633 tons, as compared with the first six months of last year. The exports were 1,964,254 tons, a decrease of 4,452 tons.

Improvements in the Treatment of Sulphide Ores of Lead Preparatory to Smelting.—T. Huntington and F. Heberlein, both of Pertusola, near Spezzia, Italy, have patented the following process (Eng. Pat. 3,795; February 12th, 1897): Lead sulphide ores are mixed with calcium oxide in proportion to the amount of sulphur present, and heated to about 700° C. The mass, on being allowed to cool to about 500° C., decomposes, giving off oxygen, which attacks the lead, forming a mixture of oxide and sulphur, much heat being developed. If air is then blown into the mass, the reaction becomes continuous, and the heat is maintained sufficiently to ensure the reaction between the sulphides and sulphates. At this stage sulphur dioxide is given off, and may be collected. The resulting mass of lead oxide and gangue is treated in the usual way.

Saline Deposits of Northern Germany.—Franz and Büttgenbach, in *Revue Universelle des Mines et de la Metallurgie*, Series 3, Vol. XXXIX, No. 1, state that there are three rivers in Germany named Saale, which name is evidently derived from numerous salines found in their valleys. In 1861 the commercial value of potassium salts (Kalialze) was recognized and the industry at Stassfurt soon assumed colossal dimensions. The deposits are of a very complicated nature and the disposition and formation of the beds must have proceeded and been interrupted many times and at different temperatures. There are at the present time 25 different species of deposits known; these are all given in the order of deposition. The most important of these salts are sylvine, KCl, and kainite, $K_2SO_4 \cdot MgSO_4 \cdot MgCl_2 + 6H_2O$. The mean thickness of the beds of the potassium salts is at least 20 m., and, considering the area covered, the authors estimate the quantity available at 10,000,000,000 tons, and, at the present output of 3,000,000 tons a year, the beds will last for 33 centuries.

*From a paper in the Biennial Report of the State School of Mines, Golden, Colo., 1896.

AN ENGLISH PUMPING PLANT FOR AN INCLINED SHAFT.

A large pumping plant was recently erected at Harrison, Ainslie & Company's iron ore mines near Ulverston, England. At these mines the operators have at times to contend with very considerable quantities of water, and as there are no coal pits in the immediate neighborhood, pumping becomes a very costly item. They therefore determined to concentrate the pumping plant at their deepest shaft, which is that of their Low Field mine, at Lendal, and for various reasons decided to do the whole work with an engine placed on the surface. The great difficulty which here met them was that the shaft of the Low Field mine is not vertical, but inclined at an angle of 42° . An attempt had already, some years previously, been made to drain this shaft by means of hydraulic pumps supplied with power water from the surface, but the water is heavily charged with mud, and shocks were set up which the machinery was not strong enough to withstand. The new engine is a Davey's differential of the ordinary type. The low-pressure cylinder is 80 in., and the high-pressure cylinder 45 in. in diameter. Both are steam-jacketed and cleared in the usual manner, and the ends are additionally protected by polished shell covers.

The shaft, as already stated, is on an incline; the total length is about 1,150 ft.; the vertical depth from the pump to the point of delivery is 735 ft., and the amount of water to be raised is 2,000 gals. per minute. The main pump, which is of the single-acting plunger type, is directly attached to the engine by means of a ball-crank and spear-rods. With

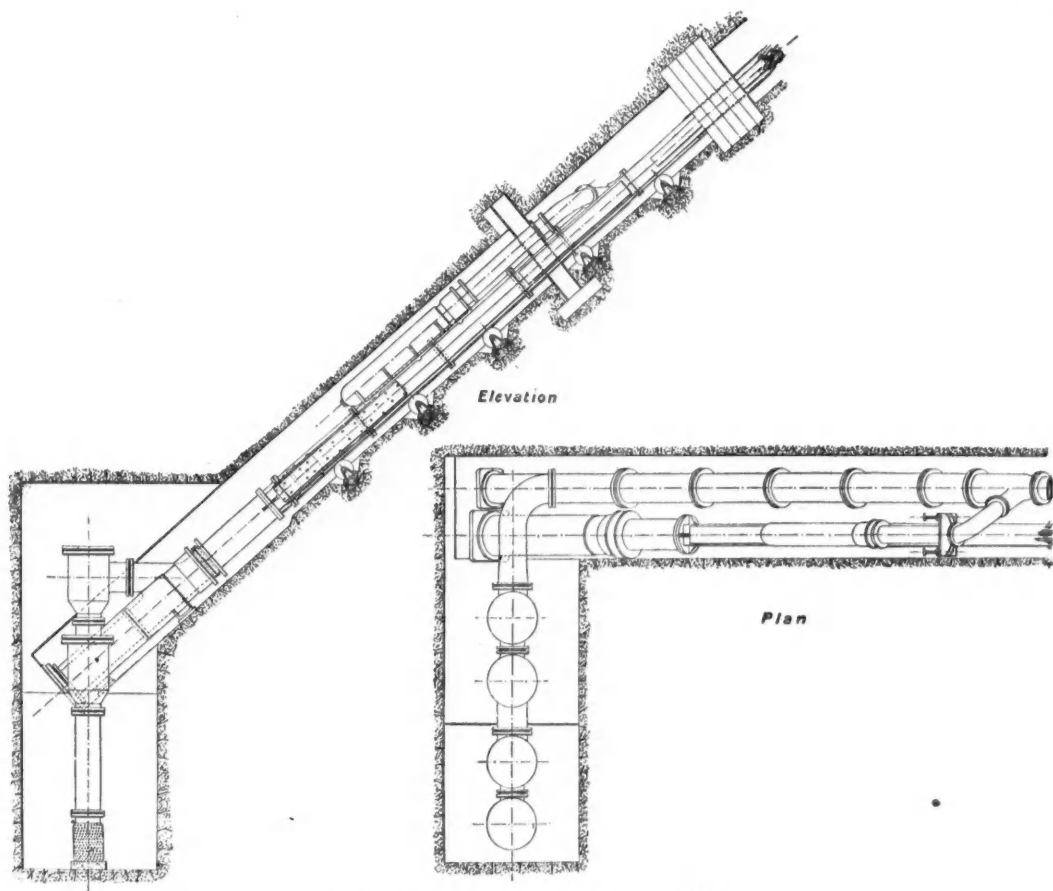
THE MANUFACTURE OF COKE IN SOUTH WALES.*

A large part of the coal produced in South Wales is suitable for the manufacture of coke. This statement, however, does not apply to much of the steam coal produced in the north and middle of the field. Speaking generally, the best gas and house coals are obtained from the coals of the Upper Pennant series, and the best coking and manufacturing coals from the Lower Pennant series. What is known as the white ash series, on the northern outcrop, has been extensively used for iron making purposes since about the middle of the last century.

The old form of coke oven in South Wales was of almost rectangular form, and had a width varying from 5 ft. to 6 ft., a length of 14 ft. and a height inside to the crown of the arch of 5 ft. 6 in. Sometimes they were provided with side and bottom flues. The oven is charged from the top or side, the usual charge being $4\frac{1}{2}$ tons for the first three days and five tons for the remaining four days, the time varying from 72 to 96 hours. The charge is generally drawn by means of a windlass, and the watering is done sometimes in the oven, and sometimes after the coke is drawn.

The Coppée oven has been largely introduced within recent years with satisfactory results. In this oven the charge is usually about 3 to 5 tons and the time of coking 24 hours. Each oven produces 10 to 20 tons of coke weekly.

According to Professor Galloway the most recent form of oven is a chamber about 30 ft. long, $6\frac{1}{2}$ ft. high, 21 in. wide at one end and 26 in. at the other. It is arched over on the top and covered with 2 ft. or more



ARRANGEMENT OF PUMPS IN INCLINED SHAFT.

the object of partially equalizing the delivery on the indoor and outdoor strokes, a subsidiary ram 17 in. diameter is provided. This ram, which is hollow, is stationary, being connected to a branch on the delivery main, while the ram case is attached to and moves up and down with the spear-rods, with the result that an amount of water equal to the displacement of this ram is subtracted from the delivery during the down stroke of the main plunger and redelivered during the alternate up stroke, the joint action being similar to that of an ordinary compound ram. The bell-crank is balanced so as to equalize the work to be done on the outdoor and indoor strokes. The spear-rod, 1,150 ft. long, is 22 in. square, and is made up of lengths of four 11-in. rods jointed with steel spear plates in the usual manner, and is carried on cast-iron rollers. It is, according to the *Engineer*, to which we are indebted for this description, the largest spear-rod in the world. The main plunger is $30\frac{1}{2}$ in. in diameter and has a stroke of 10 ft. The pump valves are double beat, and a duplicate set of valve boxes has been provided, controlled by a system of sluice valves, so that in the event of the failure of any valve the alternate set of valve boxes can at once be put into use. The accompanying illustration shows the arrangement of pump, valves, etc., at the bottom of the inclined shaft.

The Hoepfner Nickel and Copper Process.—A strong German company has been organized to exploit Dr. Hoepfner's electrolytic process for the production of nickel and copper.

of non-conducting material. It has four openings in the top in the direction of its length, spaced at such distances that when the small coal is allowed to fall through them into the oven it can be uniformly distributed with the least amount of labor. Each of these openings is provided with a cover, which is placed over it after the charge has been introduced, and each end of the oven has a sliding or hinged door, which is closed and luted with clay. Fifty or more of these ovens are built side by side in a block. The distance from center to center of two adjoining ovens is about 40 in. The hot gases produced in coking are drawn out of the oven by the action of a chimney, common to all the ovens, first into flues constructed in the sidewalls between the ovens, and thence into a large common flue, which passes beneath the whole range.

At the front and back of each range of ovens there is a platform about 40 ft. wide on the same level as the floor of the ovens. On the platform at the back a line of rails is laid parallel with the ovens, on which a trolley carrying a small engine and boiler can work backward and forward. The engine actuates a pinion geared into a rack on a rod upward of 30 ft. long, which lies across the trolley, is at right angles to the line of rails, and is parallel with, and at the same height as, the center line of the charges of coke. At its end nearest to the ovens this rod carries a vertical shield, whose dimensions are nearly the same as those of the cross-section of an oven.

*Abstract of an article in the *Iron and Coal Trades Review*, Aug. 20, 1897.

When the time has arrived for pushing the coke out of any oven in the range, the doors at the front and back are opened. The trolley is brought into position with the shield opposite to the oven. The engine is then set in motion and the shield is pushed slowly through the oven, driving the coke in front of it to the platform on the other side, where it is cooled. When an oven has been emptied in this way the shield is drawn back, the covers are removed from the four openings in the top and a fresh charge is poured down through them from hopper-wagons which run on four corresponding lines of rails on the top of the range. The charge is equally distributed by the attendants, who stand on the lower platform and rake it into place by means of rables with long handles. The doors are then shut and luted, the covers are replaced on the openings in the top, and the sides, bottom and top of the oven being still red-hot from the effects of the previous charge, the operation of coking commences immediately.

The charge of an oven is 5 tons; the time occupied in coking 2 days, and the quantity of marketable coke produced is about 70% of the weight of the coal which was filled into the oven in the first place.

In discussing the cost of coking in the South Wales field, Professor Galloway estimates that if the market price of coal at the pit is 3s. 2 3/4d. per ton, and if 6% of ash is removed by washing, it will then cost 3s. 2 3/4d., plus 1d. per ton, the cost of washing, making its total cost 3s. 3 3/4d. But each ton of washed coal produces only 70% of salable coke, so that the coal required to make a ton of coke costs 4s. 8 1/2d. A ton of salable coke, therefore, costs altogether: Coal, 4s. 8 1/2d.; labor, stores, etc., 1s. 2 5/8d.; total, 5s. 10 5/8d. From this we have to deduct the value of the water evaporated in the boilers by the hot gases, viz., 1s. 0 7/8d.; and the value of the breeze which may be neglected; leaving the total cost of the coke as 4s. 9 7/8d.

A coking oven of the size described, together with all its appurtenances, costs about £200, and produces 2 1/2 tons of coke per day—or, say, 700 tons of coke per annum. If 10% is charged for interest and depreciation (remembering that repairs have been already charged against the coke) this item amounts to 6 8/6d. per ton of coke, and the coke can be sold at 5s. 4 6/6d. without loss.

A New Diamond Field in South Africa.—A new diamond field has been proclaimed by the Governor of Cape Colony in the district of Barkley West, Griqualand West. The discoverer of the field was Frank Smith, an old Kimberley Jagersfontein digger. About 12 months ago Smith obtained prospecting licenses over the H. V. 54 farm, on which he spent a fortnight looking for indications, but found nothing. A little across the border line, however, and about 200 yds. in the next farm, he picked up a few pieces of carbon which he traced to a slight kopje, whence it had probably been washed down. Being trespassing, he could only make a small hole, but in this he struck yellow ground. He dry-sorted the few handfuls he took out, and then covered up the hole and went to Kimberley. A prospecting licence was then taken out, and a rush of people thither at once took place, and, it is said, the work has already resulted in the discovery of about 645 carats of diamonds.

Boiler Construction.—A paper on experiments in boiler bracing by Mr. Francis J. Cole, read at a recent meeting of the American Society of Mechanical Engineers, showed that the average holding power of stay bolts, when screwed through three-eighths plate and riveted over, when cold, is 16,350 lbs. for the worst, and 24,000 lbs. for the best, and when hot 3,470 lbs. for the worst, and 4,613 lbs. for the best. This indicates that the best riveted head which can be formed cold, made in the usual conical shape, has a holding power, hot and cold, very much less than the worst form of bolt and solid head, even when nicked or grooved deeply under the head, or bolt screwed through with a nut on under side of sheet. It does not appear that the solid bottom head bolts are deficient in holding power when tested in this manner, but the principal objection to their use is the liability of injury when screwed into a firebox where the holes are not tapped at right angles to the sheet and where the surface of the sheet is curved.

Gold Mining in Victoria.—During the first half of the current year the amount of Victorian gold received at the Melbourne Mint was 374,117.05 oz., against 380,672.44 oz. for the corresponding period of 1896. It is stated, however, according to a correspondent of the *London Mining Journal*, that some of the banks held a quantity of unminted gold in bars in view of a sudden demand from Japan, and if this were taken into account the return for the half year would show a substantial increase. According to the same authority it is astonishing that the decrease was not greater, owing to the extreme drought through which a large portion of the colony has passed. It is only recently that alluvial miners have been enabled to use water under the control of the Water Supply Department, and though some of the lost time may be made up before the end of the year the ultimate result must be a less gold yield than was anticipated. In June the yield was 68,029.17 oz., against 89,244.80 oz. for the same month last year.

The Mulhouse Prizes.—The Société Industrielle de Mulhouse gives two principal prizes of 5,000 fr. each, at intervals of 10 years, for discoveries or inventions held to be most useful to Alsatian industries. The next award of one of these prizes will be made in 1899. Other prizes, principally medals, are annually awarded for less important advances in the industrial arts, while money prizes are awarded to workmen, with a view to encouraging the growth of economy and the family affections among them. Among the next awards of interest to engineers is a medal and 500 fr. for the best memoir on a new and advantageous method of constructing factory buildings. A medal is offered for a boiler, giving an efficiency of 80%, capable of being worked efficiently at varying outputs, and to cost for maintenance not more than elephant boilers of the same power. Another medal is offered for a satisfactory integrating indicator. Similar awards are offered for new and reliable methods of steam heating, and for large gas engines, while medals and money prizes of 500 fr. each are offered for a research on the flow of steam in pipes and for a self-registering pyrometer.

UNDERGROUND FIRE ATTRIBUTED TO ELECTRIC CONDUCTORS.*

The special cause to which experts attributed the fire which broke out in the Hermenegilde pit of the Kaiser Ferdinand Nordbahn Collieries, causing 16 deaths, the difficulties attending the rescue, the precautionary measures employed in Austrian Silesia against underground fires, and those which J. Bergrath Mayer has been induced by the study of recent facts to recommend, form the subject of a communication by L. Champy in the *Annales des Mines*.

Part of the mine water, about 1 c. m. (220 gals.) per minute, from the fifth and eighth levels, actuated a turbine, which drove a dynamo for electrically lighting the two engine rooms and landings at the eighth and ninth levels. The difference of potential at the terminals was 90 volts in normal working; and 23 16-candle lamps were maintained in shunt circuit, so that the total intensity of the current could not have exceeded 20 or 25 amperes. In normal working a current of 7 to 8 amperes at the outside would pass through the copper wire of 2.5 mm. between the ninth and eighth levels; and the current was divided between the engine-room on the fifth level and the landing at the eighth, both being provided with open fusible plugs enclosed in an oak box. The leads connecting the ninth with the eighth level were insulated with a bituminous casing covered with lead, that was in turn protected by a bituminous coating; and the leads which connected the eighth with the fifth level, 2 mm. in diameter, were only insulated by india-rubber, covered by a bituminous coating, all the conductors being protected from blows by strips of wood nailed to the side of the shaft. Under these circumstances the rule was largely satisfied that establishes between the diameter of the wire and the normal intensity of the current a relation such that for a double intensity the temperature should not exceed more than 40° C. (104° Fahr.) the surrounding temperature, which varied from 20° to 25° C. (mean 72.5° Fahr.). At the landings the conductors were also enclosed in wood moldings, those in the roads being both insulated and carried by insulators.

The commission of enquiry attributed the cause of this fire to a short-circuiting of the underground electric conductors, or rather to the rupture of one of the conductors, and the formation of a continuous arc which ignited the bituminized coating, and then the wood strips; and as the result of experiments it discarded the hypothesis that the oak case enclosing the fusible plugs was ignited by one of them. After this accident the electric installations of the company's other mines were thrown into disuse until they were brought into entire conformity with the Belgian ordinance of March 15th, 1895, as to the use of electricity in mines.

Bergrath Mayer is in favor of isolating mines from downcast air-shafts by means of iron doors set in masonry near the landings, and even of isolating the various districts one from another by similar doors, which the men whose duty would oblige them to open and shut such doors frequently would be enjoined to close in case of fire breaking out. At various points of the mine blind headings, provided with compressed-air service cocks, and closed so as to be air-tight, might serve as refuges for men overtaken by smoke. This last measure, rational and in some circumstances practical, provides for the case, relatively probable, in which the men might not be able to escape in time from the smoke of a fire breaking out on the intake side of the air current, and also the case in which, owing to circumstances similar to those described above, two neighboring air-shafts might happen to be invaded by smoke or gas at the same time.

Lead in Alsace.—The Neue Kirche Company is reported to have found galena ore at a depth of 340 ft. in the Amora Mine, near Moosch. The vein, which appears to be of great length and regularity, is 6 ft. wide, and assays 0.145% silver, 2% copper and 48% of lead.

Nitrate Statistics.—The Permanent Nitrate Committee's statistical circular for August states: "Total exports to Europe, July, 1,846,000 quintals; loading for Europe, August 1st, 1,836,000 quintals. Imports—Europe, July, 59,540 tons; deliveries, Europe, July, 43,430 tons. Visible supply—Europe, August 1st, stocks and afloat, 344,270 tons."

Mining in New Caledonia.—The export of nickel ore in 1896 was 37,254 tons, of which 15,158 went to France and 22,096 to Germany. The total value of this ore was 2,041,358 francs. Of chrome ore 17,887 tons, worth 967,942 francs, were exported to Europe, and of cobalt ore 5,204 tons, worth 490,450 francs, of which 1,047 tons went to France. Many new mining companies were brought into existence last year, and the exploitation of copper, silver, lead and gold mines—for so long discontinued owing to lack of capital—is now said to be going on with renewed vigor.

Comparative Values of Australasian Coal.—The Government analyst of Victoria recently tested the relative values, for steaming purposes, of coals from the mines of Victoria and New South Wales. He reported that in British thermal units the New South Wales coal ranged from 13,357 to 14,153, while that of Victoria ranged from 11,648 to 12,713, the best sample being from the famous Silkstone Colliery. The contract prices quoted range from £725 to £816 per 1,000 tons.

Carborundum versus Emery.—According to a paper, *Dingler's Polytechnisches Journal*, July 9th, this question is at present occupying much attention in Europe. In emery the abrasive material is crystallized aluminum oxide; in carborundum it is carbide of silicon. Although carborundum is much harder, its crystalline structure is less favorable for grinding than is emery. The crystals of carborundum are long and narrow, with few cutting edges and smooth faces while emery crystals are nearly cubical and have rough surfaces. Perhaps the greater hardness of carborundum is offset by the better cutting properties of the emery. This is also indicated by the difficulty in keeping carborundum wheels from glazing when too much slag is used in making them. The author of the paper quoted concludes that emery has the advantage over carborundum for grinding or polishing purposes in all cases except where the finest grades are used. For the latter carborundum seems to be the better.

* From the *Colliery Guardian*, Aug. 13, 1897.

CUBAN IRON ORE SHIPMENTS.

The total shipments of iron ore from Cuba to the United States, from the opening of the mines in August, 1884, to the end of December, 1896, were 3,034,504 long tons. This ore was shipped by the Juragua Iron Company, the Sigua Iron Company, and the Spanish-American Iron Company. In October, 1892, the Sigua Iron Company made its first shipment of Cuban iron ore to this country, 7,880 gross tons being shipped by this company in 1892 and 14,022 tons in 1893. In 1895 the Spanish-American Iron Company also commenced shipping iron ore from Cuba to the United States, its shipments amounting to 74,992 tons in 1895 and to 111,584 tons in 1896. Practically all the Cuban iron ore imported into the United States is now received at Philadelphia and Baltimore, although a few years ago small quantities were also entered at Perth Amboy. Unless the insurrection in Cuba should compel the mines to shut down, the total ore shipments for 1897 will probably be considerably in excess of those of 1896. Shipments of iron ore by the Spanish-American Iron Company, whose mines are near those of the Juragua company, have probably been larger in the past few months than at any previous time in its history. The Sigua Iron Company, which also owns iron-ore mines in the vicinity of the Juragua and Spanish-American properties, has not mined any iron ore since 1893.

Year.	Long tons.	Year.	Long tons.	Year.	Long tons.	Year.	Long tons.
1884	21,798	1888	193,048	1892	330,357	1896	409,833
1885	81,106	1889	256,278	1893	362,855		
1886	111,710	1890	362,068	1894	159,439	Total	3,034,504
1887	97,711	1891	266,377	1895	386,044		

Electrolytic Copper Refining in Europe.—The Osaka Electrolytic Refining Company of Japan, a recently floated undertaking, has paid a 12% dividend as the result of its first year's working. A new electrolytic refinery has been started at Smėinogorsk, near Tomsk, Siberia.

Iron Mining in Russia.—Russian miners not having turned out a success at the iron mines of the Jurjewka works in the Ekaterinoslav government of the Donetz, a number of miners have lately been brought from Upper Silesia, in hopes that Upper Silesian methods will prove more successful.

Underground Waters.—P. Chalon, in the transactions of the French Society of Civil Engineers, discusses the genesis of underground waters and their action on rocks, the conditions of permeability of strata, and the sinking of wells. The memoir contains much of interest in relation to the formation of ore deposits.

The Meeting of the Iron and Steel Institute.—At the meeting of the Iron and Steel Institute at Cardiff on Tuesday, August 3, Thomas Wrightson read a paper on "On the Application of Traveling Belts to the Shipment of Coal." Geo. D. Hammond described "The Manufacture of Tinplate." Professor Ponthiere read a paper on "A Thermo-chemical Study of the Refining of Iron." E. H. Saniter on "Carbon and Iron;" and J. H. Wicksteed on "A Portable Recorder for Tests on Metals."

A Famous Prospector.—The discoverer of the Mount Bischoff tin mine, in Tasmania, James Smith, has recently died. Smith was invariably known as "The Philosopher," and only those who have experienced the enormous difficulties of piercing the dense scrubs and rugged mountains of the West Coast can form any conception of what this man went through, says a correspondent of the *London Mining Journal*. Although he might have been almost a millionaire—for he had 4,400 out of 12,000 shares in the Bischoff mine—it is said that he gave interests away to those who had aided him during his earlier career, and in the end died poor. The Tasmanian government granted him a life pension of £200 per annum in 1878, and this sufficed to keep him in comfort for the remainder of his days.

Electrolytic Zinc Winning.—Siemens & Halske's latest process consists of the treatment of the dry ore (blende, or blende mixed with galena) with chlorine gas until chlorination is complete, solution of the chlorides in water, or water to which a little NaCl or HCl has been added, and electrolysis of the solution between an insoluble anode and a metallic cathode, whereby metallic zinc is precipitated and chlorine set free, which is used for the treatment of a fresh lot of ore. Lead goes partly into the solution, but silver remains with the insoluble residue. It is never advisable to carry on the electrolysis so far as to effect complete decomposition of the chlorides on account of the cost of the electrical energy; for this reason an excess of chlorine is provided in the solution by the addition of common salt. The undecomposed chlorides are not lost, however, since the nearly spent solution from the electrolytic vats is employed as lixiviant for fresh lots of ore.

Petroleum in the Dutch East Indies.—A great deal of capital is being invested in the oilfields of the islands of Sumatra and Java. Last May the East Indian Exploration Company was organized at Amsterdam, Holland, with a capital stock of 300,000 florins, to develop a tract of oil land comprising 35,000 acres in the residency of Samarang, Java. On an area of 500 acres, which is explored so far, more than 40 natural oil wells were found. Experts entrusted with a preliminary investigation rendered a glowing report as to the productivity of the oilfield. The latter is located in the districts of Singendul, Singenlor and Manggar of the residency named, in the immediate neighborhood of the railway station of Telewa, the railway intersecting the field at several places. The Petroleum Maatschappij Moera Enin, which was organized recently at Amsterdam with a capital stock of 10,000,000 florins, is the successor of a syndicate formed in 1895, and composed of the Bank of Paris, the Berliner Handels-Gesellschaft of Berlin and Messrs. Labouchere, Oyen & Company, of Amsterdam. This syndicate has secured concessions on large tracts of land in the residency of Palembang, Sumatra.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

MODIFICATION OF MINING CONTRACT.—The lessee of a mine notified the lessor that he would be compelled to shut down the mine if he had to continue to pay the royalty named in the lease, because of extra difficulty in mining. It was then agreed, in order to prevent a forfeiture of the lease, and to secure the lessor a royalty from the mine, that a less royalty should be paid, and the reduced amount was paid for several years. The court held that the agreement for the reduction was binding upon the lessor, and that there was a consideration for the new contract. —Sargent vs. Robertson (46 Northeastern Reporter, 925); Appellate Court, Indiana.

WHEN PURCHASE OF STOCK IS NOT ULTRA VIRES.—A purchase by a corporation organized to deal in hardware is not ultra vires, where it is made to protect its own claims against such mining company. —M. Honey vs. Butte Hardware Company (48 Pacific Reporter, 545); Supreme Court Montana.

REINCORPORATION AND REORGANIZATION OF MINING COMPANY.—Where a mining corporation leased its property for five years, the lessee agreeing to organize a leasing company to which the lease was to be assigned, and the stock of which was to be offered to the lessor's stockholders, it was held that the new corporation, when so formed, was not identical with the old, and that the statutory liens of persons furnishing supplies to it did not attach to the lessor's title. United Mines Company vs. Hatcher (79 Federal Reporter, 517); United States Circuit Court of Appeals.

UNDERGROUND DISCOVERY OF VEIN.—The discovery of a vein in a tunnel, worked according to the laws of the United States (Revised Statute, Sec. 2,323), gives a right to the possession of the vein to the same length as if discovered from the surface, and a location on the surface is not essential to a continuance of that right. —Campbell vs. Ellet (17 Supreme Court Reporter, 765); United States Supreme Court.

LOCATION OF CLAIMS ON PUBLIC MINERAL LANDS.—The right given by the law of the United States (Revised Statutes, Sec. 2,323) to a vein discovered in a tunnel, dates by relation back to the time of the location of the tunnel site, and the right of locating the claim to the vein arises upon its discovery in the tunnel and may be exercised by locating the full 1,500 ft. on either side of the tunnel, or in such proportion thereof on either side as the locator may desire. Such location, therefore, gives superior right as against a surface location made after the location of the tunnel, but before discovery of the vein in same. —Enterprise Mining Company vs. Rico-Aspen Consolidated Mining Company (17 Supreme Court Reporter, 763); United States Supreme Court.

RIGHT TO FOLLOW LOPE.—When a vein of mineral-bearing rock, in its course lengthwise, after passing under the surface limits of one location, on which it outcrops, crosses nearly at right angles the side lines of another, prior location, on which it also outcrops, the side lines of such prior location becoming, by reason of the course of the vein, its end lines, the right to follow the lode in its downward course, between the vertical planes drawn through such end lines, belongs to such prior location, and the extra-lateral rights of the other location cease when the vertical plane so drawn between the two locations is reached. —Tyler Mining Company vs. Sweeney (79 Federal Reporter, 277); U. S. Circuit Court of Appeals.

When a lode enters an end line of a regularly located mining claim, and runs its course lengthwise, nearly parallel with the side lines of the claim for the greater part of the length of the claim, the owners of the claim are not deprived of their extra-lateral rights because the lode crosses a side line before reaching the other end line, but such rights will extend from the end at which the lode enters to the point at which it crosses the side line, whether a new end line is regarded as being drawn at that point or not. —Republican Mining Company vs. Tyler Mining Company (79 Federal Reporter, 733); United States Circuit Court Appeals.

Manganese Mining in Greece.—Manganese mining is being carried on at Cape Vani, on the Cyclades by a French company, and a similar undertaking has been started at Fourkovuni Point by a British concern. The beds have been proved to exist in parallel layers in a hill abruptly rising from the shore to a height of 400 ft. Over 15 tunnels from 100 ft. to 400 ft. long have been opened in them, and show 2 ft. to 6 ft. of ore. The ore is intermixed with clay, from which it is easily separated.

A Good Record in Coal Outting.—The Jeffrey Manufacturing Company, of Columbus, O., has just received a report from Mr. James Cameron, superintendent of the Western Coal and Mining Company's No. 2 mine, situated in Arkansas, in which he states that with a Jeffrey electric machine equipped with a self-propelling truck, and operated by two men, they were able on August 13th to make 95 cuts in 9½ hours. This work was done in five rooms and two entries and necessitated the changing of bits a number of times. It was necessary to load and unload the machine seven times.

Lead Smelting at Bleiberg, Austria.—The report of the Bleiberger Bergwerks-Union for 1896 shows that the Bleiberg and Kreuth mines produced 4,629 m. t. of galena concentrates, against 4,169 in 1895. The ore broken in the mines amounted to 79,182 m. t. which yielded 5.7% lead ore and 3.2% zinc ore (blende). At the Bleiberg works, two American hearths smelted 1,081 m. t. of lead ore with a yield of 70.32% Pb at a cost for smelting of 99 kr. per 100 kg. of lead. The Belgian reverberatory and Pitz furnaces at Gailitz smelted 36,422 m. t. of ore, yielding 52% Pb, at a smelting cost of 2.06 florins per 100 kg. of lead. The ore broken in the Mess mines yielded 10.6% galena. The two American hearths connected therewith smelted 2,825 m. t. of ore, which yielded 1,970.4 lead, the loss being 10.56%. The cost of smelting was 83.07 kr. per 100 kg. of lead. In the reverberatory furnace, 70.85 m. t. of fines yielded 29.68 m. t. of lead, at a cost of 1 fl. 84.5 kr. The total net earnings of the company in 1896 were 82,808.85 florins.

PERSONAL.

SIR LOWTHIAN BELL has successfully passed through an operation for cataract. He is now in his 82d year.

MR. J. THOMAS, mining engineer, of Spokane, Wash., is examining the Libby District, Flathead County, Mont.

MR. T. A. RICKARD, mining engineer, of Denver, Colo., has arrived in Australia, whither he has gone on professional work.

MR. JOSEPH PHILLIPS, mining expert of Nashville, Tenn., is investigating the gold-bearing region in which Dahlonega is situated.

MR. JOHN Y. COLE, superintendent of the White Bear mine, Rossland, B. C., is on a visit to the Eastern States and provinces.

PROFESSOR H. L. SMYTHE, of Harvard University, has recently visited the mines of Clear Creek and Gilpin counties, Colorado.

MR. WALTER H. WILEY, of Idaho Springs, Colo., is examining copper properties in Idaho and Montana for the Anaconda Company.

MR. H. L. WEED, president Spokane & South Mountain Mining, Milling and Smelting Company, of Spokane, Wash., is in San Francisco.

MR. A. R. NICKELS has resigned his position as chemist at the Omaha & Grant Smelting Works, Durango, Colo., and has removed to Ouray.

MR. D. S. JACOBUS has been appointed professor of engineering at the Stevens Institute, Hoboken, N. J., to succeed Prof. De Volson Wood, deceased.

PROF. GEO. C. TILDEN has arrived at San Francisco, Cal., from New Zealand. He will examine mining properties in the interests of his principals.

MR. JOHN S. KENNEDY, blast furnace and mining engineer, of Chambersburg, Pa., has been engaged recently in examining mining properties in Alabama.

MR. S. TATE, of Memphis, Tenn., president of the Appalachian Gold Mining Company, and MR. NORWOOD, general manager of the Kentucky mine, are visiting Dahlonega, Ga.

MR. PAUL JOHNSON, who recently resigned his position as superintendent of the Hall Mines, B. C., smelting works, is about to leave for Mexico, where he has accepted a similar position.

MR. WILLIAM FRECHEVILLE, the well-known English mining engineer, is visiting Australia, where he intends to spend several months examining the principal mining districts.

MR. L. J. HARTZELL, late of the Montana Ore Purchasing Company, has moved to Rochester, Mont., where he will be the metallurgist of the Montana Mining and Smelting Company.

MR. J. R. TOOLE, of Anaconda, Mont., representing Gov. R. B. Smith and Marcus Daly, of that State, is now in the North investigating Alaskan mining properties with a view, it is said, to extensive investment.

MR. ROBERT DAY, an Irish J. P. and one of the directors of the Hall mines, Nelson, B. C., is now in the Kootenay district of British Columbia. He is accompanied by MR. ROBERT WARD, another director of the same company.

MR. HERMANN THOFERN, expert in electrolysis of metals, has returned to New York from a professional tour of Montana that has lasted since May. He will return to that State in a few days, resuming his duties as consulting engineer of several properties.

MR. WILLIAM C. AGLE, who recently returned from Peru, where he was interested in the Tipuani gold-fields, which he described in the *Engineering and Mining Journal*, has gone to the Klondike. Mr. Agle was in the Yukon country from 1886 to 1889.

MR. WILLIAM OGILVIE, the Dominion land surveyor, who has been making topographical surveys of British possessions along the Klondike, has been recalled by the government for consultation as to important matters affecting the new gold-fields. He will make a report embodying suggestions for new mining laws, governing the sale of liquor and taking wood for fuel, etc. He made a census of the production of the new fields, and found that 23 claims produced \$826,000.

SIR ROBERT GIFFEN, K. C. B., Controller-General of the Commercial, Labor and Statistical Department of the British Board of Trade, is about to retire, having reached the age at which he is at liberty to do so. His retirement will take effect on October 1st. Sir Robert's retirement is, says the *London Times*, a loss to the public service, but a gain to the general public. In the leisure that he now acquires he will be able to devote himself to the completion of important works on which he has been engaged for some time, but which the pressure of official duty prevented him from carrying out as quickly and as thoroughly as he desired. Still in the full enjoyment of his faculties, he will be able to render to economic and statistical science services which no living authority is better capable of performing.

OBITUARY.

ISAAC PETERS, who has been connected with the iron industries of Ironton, O., died recently, aged 79 years. He had been instrumental in the establishment of many of the blast furnaces in Southern Ohio and Northeastern Kentucky, and in association with John Campbell, Cyrus Ellison and others organized the industries which made Ironton, O., a commercial city.

GEN. ORLANDO EVANS, one of the best-known men in Nevada, died at Reno, Nev., recently, after a brief illness. General Evans went to California in 1849; was a successful miner in Nevada County, Cal., owning and selling to an English Company the celebrated Buckeye Hill mine, near North San Juan. He was one of the original owners of the Gould & Curry mine at Virginia, Nev.

ERASTUS CORNING, prominent in financial and manufacturing circles, died at Albany, N. Y., on August 30th, aged 50 years. He was educated at College Hill, Poughkeepsie, N. Y., and at Union College. At the age of 25 years he became a member of the firm of Corning & Company, and also took an interest in the Albany Iron Works. In 1875 by the consolidation of the firms of E. Corning & Company, and John A. Griswold & Company, of Troy, N. Y., the Albany & Rensselaer Iron and Steel Works was formed. In 1885 Mr. Corning was chosen a director of the New York Central & Hudson River Railroad, to fill the vacancy caused by the death of James H. Rutter. He also held other positions of note.

CHARLES PENROSE WILLIAMS, Ph. D., one of the best-known chemists in Pennsylvania, died suddenly at his home, in Crafton, Pa., August 24th. Dr. Williams was born in Philadelphia in November, 1837, and received his preparatory education in a high school. He then took a course in chemistry in the University of Pennsylvania, in which course he received the degree of doctor of philosophy. In his university work he showed great proficiency in scientific work, and decided to make teaching his profession. He soon received a call from the Philadelphia Polytechnic Institute, and for some time he was professor of chemistry at that place. He then went to a college at Dover, Del., acting in the same capacity. After this he took the chair of chemistry in the University of Missouri. In teaching he was successful, but left it for more practical work. He became consulting chemist for the Judson powder works, at San Francisco, and later held the same position in the Ramapo powder works in New Jersey. He had a large practice as a mining expert, in developing zinc, tin, gold, silver and phosphate deposits. It was largely through his work that the phosphate beds in South Carolina were developed. Dr. Williams went to Natrona in 1887 and built a copper plant for the Pennsylvania Salt Company, and while there was chosen by the salt company to represent it in its trouble with the farmers of Natrona, who made complaint about the poisonous gases from the works. His decision was acknowledged by both parties to be very fair and impartial. He then went to Butler, where he was chief chemist for the Butler Salt Company. After living at that place for eight years he removed to Crafton, where he had been up to the time of his death. His last two years were spent in study and rest after a busy life. During his long connection with different universities and chemical works he wrote much on scientific subjects.

INDUSTRIAL NOTES.

The Norristown (Pa.) Rolling Mills have resumed work on full time.

The roughers' strike at Jones & Laughlins works of the South Side, Pittsburg, is still on.

The Lozan & Strobridge Iron Company's works at New Brighton, Pa., is now in full operation.

The Danville (Pa.) Nail Works have been purchased by C. R. Baird & Company, of Philadelphia.

The strike at the Britton tin plate mill, Cleveland, O., has been settled and the men have gone back to work.

The Belfont furnace at Ironton, O., will blow in as soon as a sufficient supply of coal can be secured.

The Union Malleable Iron Works, of Moline, Ill., are erecting gas producers to operate their annealing ovens.

The Midvale Foundry, at Allentown, Pa., will add a pattern shop 50 x 100 ft. and a foundry annex 68 x 100 ft. to its plant.

Preparations are being made to blow in the third furnace of the Troy Steel Company at Breaker Island, near Troy, N. Y.

The Falcon Iron and Nail Company, of Niles, O., has added a large sheet mill to its plant, making four mills now in operation.

Negotiations are being made by H. T. Strouse with parties in Shamokin and Sunbury, Pa., to locate a tin plate mill at one of these towns.

The property of the Etna Iron Works, at Ironton

O., will be sold on September 25th by the trustees, Clark and Lee, of Philadelphia, Pa.

The Central Iron and Steel Company, of Brazil, Ind., is building a new spike mill, 65 x 100 ft., and is making repairs in other departments.

The Illinois Steel Company recently put its works at Milwaukee, Wis., on full time, the company having signed the amalgamated scale.

The American Wire Nail Company, at Anderson, Ind., contemplates the extension of its plant, and has therefore purchased additional ground.

The Washington (Pa.) Sheet and Tin Plate Mills have doubled their capacity, and are now running full time. The plant consists of nine mills.

The Cleveland-Cliffs Iron Company, of Gladstone, Mich., has installed a testing machine at its Pioneer Furnace, for proving the strength of its charcoal iron.

The Tennessee Coal, Iron and Railroad Company has put one of its Oxmoor furnaces in blast, making 14 furnaces in operation in the Birmingham District.

Subscriptions to the new co-operative rolling mill to be run at Scottdale, Pa., by the strikers, have reached \$72,000, and a site has been offered them in North Scottdale.

The Schoen Pressed Steel Company, of Pittsburg, is erecting three steel buildings, 600 x 120 ft., 400 x 120 ft., and 325 x 90 ft., thus doubling the present capacity of its plant.

The Iowa Iron Works, Dubuque, Ia., has secured from the United States government a contract for building a steel steamer to be used in making river improvements.

The Indiana Bridge Company, of Muncie, Ind., recently secured a contract for building a bridge at Fort Williams, Canada, to cost \$30,000, for the Canadian Pacific Railroad.

The Pennsylvania Steel Company, of Steelton, Pa., is now operating its slab mill on full time. It has completed the improvements of its No. 2 blooming mill, and has three furnaces in blast.

The agreement arrived at between the leading American dynamite companies and the Nobel Trust has been ratified. Its provisions exclude American dynamite from the South African market.

The H. W. Johns Manufacturing Company contemplates the erection at Chicago Heights, near Chicago, of an important plant for the manufacture of pipe covering and asbestos for general purposes.

Zug & Company, Limited, of Pittsburg, contemplate the erection of producer gas furnaces, two additional stands of rolls, an electric crane, a pickling department, and a warehouse to complete their plant.

The Sharon (Pa.) Boiler Works shipped recently ten 2,000 gal. iron tanks to Vera Cruz, Mex., to be used in stirring molasses. These are said to be the first tanks of this kind ever shipped to that country.

Contracts for the 2½ miles of line from the D. M. & N. to the new Pillsbury mine, near Hibbing, Minn., have been let to Gulbranson Bros., and they have gone to work. They will employ 300 men for six weeks.

Petroleum for fuel on locomotives is now being partly used by the Southern Pacific Railway Company. It is purchasing California petroleum, and has changed seven of its locomotives to crude oil burners within the last week.

The base of what will probably be the largest drop-forging machine in the world was cast at Pratt & Cady's foundry, Hartford, Conn., last week. The complete machine will weigh about 50 tons. It will carry a 3,000-lb. hammer.

The Schultz Bridge and Iron Company, of McKees Rocks, Pa., received the contract to build the new Lake Erie freight depot at a cost of about \$250,000. It will be a steel and iron building throughout, 200 x 300 ft. in size.

The plant of the Anniston Pipe and Foundry Company, at Birmingham, Ala., was burned recently owing to a defect in one of the furnaces. The loss is estimated at \$100,000, partially covered by insurance. The plant will probably be rebuilt.

The National Tube Works Company is reported to be contemplating the manufacture of seamless tubing at Christy Park, a suburb of McKeesport, Pa., and is now at work on an extensive plant. The works will probably be in operation by January 1st next.

The Chicago Pressed Steel Company has leased the Muscatine rolling mills, at Muscatine, Ia., to engage in the manufacture of steel railway ties. The plant is being remodeled and additional machinery added for increasing the capacity of the works.

Another steel plant is contemplated for the South. A proposition has been made by people in New Orleans to the Gate City (Ala.) Land Company, which asks for the donation of 20 acres of land. It is said local and foreign capitalists are interested in this undertaking.

The Kilby Manufacturing Company, of Cleveland, O., has received a contract for the erection of buildings and for furnishing machinery to the amount of \$500,000 to \$600,000, for an extensive beet sugar plant and refinery to be located at Crockett, Contra Costa County, Cal.

The Birmingham (Ala.) Rolling Mill Company will shortly increase the capacity of its steel plant to 60 tons per diem. Arrangements are being made by this company for the rapid transportation of the steel into the mill, and its immediate conversion there into rails, etc.

The Washington Coal and Coke Company at Star Junction, Pa., contemplates the erection of a new tippie, two blocks of ovens of the standard bee hive make, additional houses for the workmen and the necessary machinery to operate its plant at double present capacity.

The Mahoning Valley Iron Company of Youngstown, O., has begun operations in its new 7-in. three high finishing mills. The Hannah Furnace is being relined and will be fired within two weeks. With this exception every department of the company is in operation.

The Steel Storage & Elevator Construction Company, of Connersville, Ind., has secured the contract for the Canadian Pacific Railroad grain elevator at Ft. William, Ontario. The elevator is to have a capacity of 1,500,000 bu. of grain. Mr. F. J. Webber, of the steel company, will be in charge at Ft. William during construction.

The Standard Oil Company is building a \$200,000 pumping station in the new Indiana oil-fields, near Anderson. Work has also been begun on the construction of a pipe line into Toledo, which will connect with the New York line. The Manhattan Company will, it is announced, construct a similar line into the new oil-field from Toledo, O.

The Milwaukee Steel Casting Company has been recently organized at Milwaukee, Wis., with the following officers: President, L. V. Shaw; vice-president, O. P. Watson; secretary and treasurer, C. N. Bowen. The company is centrally located and has excellent shipping facilities. In open-hearth and crucible furnaces it is prepared to turn out castings of wrought iron, open-hearth steel, crucible steel, Mitis metal and special tool steel.

NEW PATENTS.

UNITED STATES.

The following is a list of the patents relating to mining, 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 AUGUST 24TH, 1897.

- 688,549. APPARATUS FOR POURING MOLTEN IRON OR STEEL. George W. Hierer, Allegheny, Pa., assignor of one-half to John R. Howers, Pittsburgh, Pa. The apparatus consists of an axle mounted upon wheels, a box-shaped frame attached to the axle, a rotary disk or bearing within the frame, friction rollers carrying the disk, and suitably constructed tongs, pivoted in the disk whereby the same may be moved in any desired direction.
- 688,574. METHOD OF MAKING PLATE GLASS. Charles C. Hartung, St. Louis, Mo., assignor to Edward Walsh, Jr., same place. The method consists in spreading the molten glass into plate form, cutting up, grooving or impressing its upper surface while it is being spread, and permitting the glass to form a smooth, even surface.
- 688,583. APPARATUS FOR GENERATING ACETYLENE GAS. David C. Morency, L. vs., Canada. Patented in Canada, February 10, 1897, No. 54,942. The combination, with an outer vessel for holding liquid, of an inner vessel for holding gas, a tube having its upper end connected to the gas-space of the inner-vessel and its lower end connected to the water-space of the outer vessel, and a liquid-supply pipe provided with a nozzle projecting upwardly in the tube, the flow of liquid through the nozzle and tube being regulated automatically by the pressure of the gas in the inner vessel.
- 688,613. COMPOUND FOR SEPARATING OXYGEN AND METHOD OF MAKING SAME. Ernest B. Stuart, Chicago, Ill., assignor to the General Gas Company, same place. The preparation consists of an oxygen-absorbing substance and a sufficient quantity of free caustic soda to cause the mass to liquefy at a temperature above that at which steam forms and to be maintainable in a liquid state at that temperature.
- 688,630. FURNACE. William Brothers, Hawtenshall, England. A furnace comprising an interior furnace chamber to receive the fuel provided with outlet openings placed at intervals along the sides, passages leading from the openings to an air chamber placed above and provided with regulated openings for the admission of air, into which chamber all the products of combustion are delivered by the passages and into which chamber is admitted sufficient air to promote complete secondary combustion and a combustion chamber with exits placed between the air chamber and the structure to be heated, into which chamber all the products of combustion and the admitted air pass.
- 688,631. STONE DRESSING MACHINE. Daniel W. Darling, Worcester, Mass. A machine comprising a plurality of transversely disposed beams having their ends rigidly connected with side beams forming a rectangular skeleton table, and provided with the guiding and supporting check-pieces arranged thereon; the transverse beams numerously perforated through their webs for the attachment and adjustment of the tool-shanks thereon.
- 688,740. APPARATUS FOR TREATING GOLD AND SILVER

ORES. Boda Becker, Eupen, Germany. The combination of a vat provided with amalgamating plates and adapted to contain cyanide of potassium in solution and the ore to be treated, a vat containing the electrodes of an electrolytic apparatus and means for causing the circulation of the cyanide of potassium solution through the amalgamating vat and for distributing it in the electrolytic vat.

588,792. COMPOSITION FOR MASSING FINE IRON ORE AND PROCESS OF MAKING SAME. Julius J. Czypull, Lancaster, Pa., assignor to Bertram Dawson Coleman and Edward Rion Coleman, Lebanon, Pa. A compound consisting of fine or comminuted ore, pulverized clay and liquid glue.

588,806. STAMP MILL. Gilbert M. Ross, San Andreas, Cal., assignor to the Globe Iron Works, Stockton, C. I. The combination of a frame comprising uprights and a guide beam connecting the uprights, a block arranged on the face of the guide beam and formed in one piece, and having the semicircular recesses in its face at intervals in its length, the recesses between the recesses, the horizontal slots in the sidewalls of the recesses, the seats disposed at right angles to and communicating with the inner ends of the slots, the transverse apertures communicating with the recesses, the bosses surrounding the apertures and arranged in the recesses, the flanges joining the bosses and the sidewalls of recesses, and the longitudinal central end flanges, the caps, having semicircular recesses in their inner sides, and also having apertured flanges at their ends, bolts having their heads arranged in the slots, and also having the shanks extended through the flanges of caps and provided with nuts, connecting bolts extending through the bosses and apertures of the block and also through the guide beam, and stamp-stems extending through the guides formed by the recesses of the block and caps.

588,832. CONCENTRATING MACHINE. William M. Moore, Empire, Colo. The combination with a stationary frame of a swinging table carried by the frame and provided with pulleys, means for swinging the frame, a belt passing around the pulleys and over the table, a ratchet wheel secured to one of the pulleys, a pawl arm pivoted to the shaft of the pulley and having a longitudinally sliding and pivotal connection with a pin on the stationary frame and a pawl engaging the ratchet wheel.

588,883. PROCESS OF MAKING LITHARGE OR PROTOXIDE OF LEAD FROM LEAD ORE. Pedro G. Salom, Philadelphia, Pa. The process consists in subjecting the ore to the action of nascent hydrogen electrolytically developed, producing thereby a spongy mass, then heating the spongy mass in the open air first at a temperature below the melting point of metallic lead and afterward to a higher temperature.

588,885. KILN. Carl Schlimp, Vienna, Austria-Hungary, and Rudolf Honz k. Bucharest, Roumania. The combination with a series of chambers, a chimney, an air-duct extending around the chambers, branch passages connecting the air-duct with each of the chambers, passages connecting the chambers with the chimney and valves to open and close the passages and to open the air-duct into the chimney; of gas passages extending between the chambers, branch passages connecting the gas passages with the chambers and the air duct, and valves in the passages for controlling the supply of gas.

GREAT BRITAIN.

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

WEEK ENDING JULY 31st, 1897.

- 7,222 of 1896. J. O. S. Elmore, Kapurthala, India. Electro-deposition of copper tubes of small diameter.
 - 15,889 of 1896. R. M. Wight, Cardiff. Water cars for laying dust in mines.
 - 17,127 of 1896. J. C. Graham, London. Turning chloride of copper into sulphate in order to improve the color of the deposited copper.
 - 17,608 of 1896. S. O. Cowper Coles, London. Galvanizing tubes by electrolysis.
 - 42,288 of 1897. C. O. Burns, New York. Improvement in upright revolving shafts on rock crushers.
- WEEK ENDING AUGUST 7th, 1897.
- 16,032 of 1896. W. H. Hyatt, London. Improvements on dry amalgamators.
 - 14,735 of 1897. A. Moriamé, Lambrusart, Belgium. Lifts for coal mines.

MACHINERY AND SUPPLIES WANTED.

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

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

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

GENERAL MINING NEWS.

ALABAMA.

All labor troubles in the Birmingham District have been settled.

BIBB COUNTY.

BESSEMER LAND AND IMPROVEMENT COMPANY.—Shipments have been resumed from the Belle Ellen mines below Blocton, the strikers having back gone to work.

CLAY COUNTY.

FRANKLIN.—T. H. Aldrich, of Birmingham, has bought a controlling interest in this mine. Machinery is to be installed at once.

WEST.—C. S. West and his associates have decided to work this mine, and machinery is to be purchased forthwith. The ore is said to run up to \$50 a ton, though the average would be very much lower.

JEFFERSON COUNTY.

ADGER.—A new trestle has been erected, and the tippie has now sufficient capacity.

MARY LEE.—A coal washer is being built. The output is increasing and additional hands are to be hired.

SOUTHERN CAHABA MINING COMPANY.—Operators are refusing orders, being already behind hand. Coal from this mine is going to Alexandria, Va., to supply those in the habit of using local coal, from which, however, they are now debarred by a strike.

ALASKA.

ALASKA-JUNEAU MINING COMPANY.—The July product amounted to \$24,772; expenses, \$11,500. The amount of ore crushed was 3,808 tons which gave an average yield of \$6.37 per ton.

ALASKA-TREADWELL GOLD MINING COMPANY.—The July output was \$88,881; profit, \$6,500. The amount of ore milled was 21,000 tons, which averaged \$3.12 per ton.

YUKON.—H. N. Stanley, who went to St. Michael's for the Associated Press, returned on the *Portland*, which reached Seattle on August 29th. He says:

"I have been seven weeks at the mouth of the Yukon, at St. Michael's, where I saw all the miners coming out and interviewed them. As a result I feel it my duty to advise everybody to stay out until next spring. Wild, and in many cases exaggerated, reports have been circulated since the first discoveries were made. Probably \$2,000,000 was cleaned up this spring and next spring I look for from \$5,000,000 to \$7,000,000. The fields have hardly been opened yet, but those going in now must bear in mind that everything in that region was staked long before any reports reached the outer world, and that those going in now must prospect for themselves, buy claims from the present owners or work for the owners.

"No new strike has been reported up to the time of my leaving St. Michael's. Alaska is an enormous country, and will, I believe, produce more gold than we dream of. But it is a bleak, barren, desolate country—a country incapable of supporting any great amount of animal life, and a country of such rigorous climate, both winter and spring, that none but the most hardy can possibly live in it. Even they must have abundance of food and warm clothing.

"I am aware there is a popular impression that supplies can be bought in the vicinity of the mines. They may at present be bought at six times Seattle prices, but they are taken at even those figures faster than they can be got in, and before winter is half over, if the present population stays in, there will be actual starvation.

"The average man requires about one ton of carefully selected food and clothing for a year's supplies. In the summer of 1896 about 3,500 tons of supplies went up the river, and the new population of 1,500 to 2,000 suffered from want. Of this 3,500 tons probably 1,500 were rum, tools, furniture and supplies other than provisions. This season, allowing the most favorable circumstances, not more than 4,200 tons of supplies can be got up the river, fully half of which is rum and tools, as well as supplies other than food. There are more than three times as many people there as there were last winter.

"Grub was completely cleaned out this spring, and last winter there was such a scarcity that moose hams sold for \$30 each, flour \$120 a hundred, bacon \$1 a pound. What will not happen this coming winter? Why will not people actually starve to death?

"As to shelter, 90% of Dawson was living in tents in July, labor is scarce and houses cannot be built. How are 7,000 people to withstand the rigors of a nine months' winter of semi-darkness, when the mercury goes 70° below zero?

"As to labor, it is true that last winter—the winter succeeding the great strike, when men were scarce—wages were \$15 a day; but if no new strike is made, what is to keep wages up this winter? There are but 340 claims on Bonanza, Eldorado and Hunker creeks that will probably be worked this winter. An average of eight men to each is, I think, liberal. If but 2,700 men are employed and there are 5,000 or more seeking work, what must be the result? Wages must go down. I am told that much grub has gone over the divide; yet, from what I know, I would wager that not to exceed 500 tons of supplies over and above what the carriers ate will reach the diggings. No man going in can arrive with more than a four months' supply.

"I am also told that there is plenty at St. Michael's. So there may be, but after September 15th it might as well be in New York City, for to transport it by dog train or sled over 2,000 miles of icy river is absolutely impossible. There is not, nor will there ever be, a dog train that can take enough to feed itself over 1,200 miles. Relief is, therefore, impossible. Over the divide in the winter would be quite as difficult."

Private letters received by the Alaska Commercial Company from Dawson and St. Michael's, confirm the above views and show that the outlook for hundreds of miners who went up to Alaska by sea is darker than was feared. One letter, under date of July 30th, from Dawson City, says that the summer has been unprecedentedly dry, and, joined to the light snowfall in the mountains during the previous winter, has reduced water so low, that it is very doubtful whether any of the fleet of river steamers will be able to make their way down to St. Michael's. This shallowness of water is increased by the northerly gales which in many places blow

all the water from the bed of the stream and add to the difficulties of navigation. Sandbars, which are usually covered in August, are now visible.

At St. Michael's it is thought the steamers *P. B. Wear* and *Bella* are stuck on the sandbars near the Ramparts of the Yukon. Unless heavy rains at the headwaters of the river raise the water below Dawson it will be impossible for these two boats to go down to St. Michael's as it will be equally impossible for five or six other river boats which are all above Circle City to reach St. Michael.

Without the aid of these boats the 4,200 tons of food at St. Michael's will be of no service, as it cannot be carried up river. Without this food there will be a famine in Dawson next winter, even though every man who goes over the trail takes enough to keep him, whereas it is known that many who have gone over the Chilkoot Pass have abandoned three quarters of their food in order to reach Dawson before winter sets in.

Vice-President Nibaum, of the Alaska Commercial Company, said on the 30th ult.:

"No words are strong enough to condemn the transportation companies and syndicates which have guaranteed to take passengers to Dawson this fall. We have steadily discouraged those who have applied for passage on our steamers because we foresaw this lack of provisions, and did not wish to be held responsible for the suffering and deaths that are sure to come to hundreds.

"We allowed only 114 to go up on the steamer *Excelsior*, although we could have put twice that number on her. We have made every provision possible for those who may be kept at St. Michael's, but we can't give them shelter, and there is not time nor material for building houses. Those who have gone up on vessels during the last three weeks have slender show of getting up the river, and their only course will be to compel the vessels which carried them up to bring them back again. Any interviews which encourage people to go to Alaska this fall are criminal. Even the government itself should step in and prevent the thousands on the trails from rushing to their own destruction."

Notwithstanding this often repeated advice, 360 men left Seattle for Alaska on August 30th, going by way of Skagway and Dyea. The *Detroit* was the last boat to sail, leaving with 60 passengers.

Mr. William Ogilvie, the Canadian surveyor, who has just returned from the Yukon, is quoted as saying: "Sidehill claims are being located on the creeks, and when I left there on June 12th, some of them were prospecting very well, as high as \$6 to \$8 to the pan being found in some instances. All the miners concede that 10-cent dirt (when it is 3 ft. and upward deep) is rich, but on Bonanza and Eldorado when a man found only cents he was somewhat indignant. Unless he found \$1 in every pan at least he was dissatisfied, and small wonder, for his neighbors were panning from \$5, \$10, \$15, to \$30 and \$40 to the pan and often into the hundreds."

Relating instances of rich strikes that came under his personal observations, he said: "On April 16th last George Cormack, acting for Tagish Charley, his associate, sold one-half of claim No. 2, below Bonanza, for \$5,000, \$500 down and the remainder to be paid on July 1st, or forfeit the money and claim. Passing Cormack's on July 1st, I called to see him and found the purchaser paying the balance of \$4,500. When the business was finished I asked the purchaser how he had succeeded.

"Oh," he said, "pretty well. I drifted 24 ft. long by 14 ft. wide and cleared up \$8,000."

Ogilvie also draws the following picture for the benefit of intending gold seekers:

"Every dollar found there, it might be said, is the product of physical pain and misery. In summer there are mosquitoes innumerable, swamps, too, to be traversed, and mountains to climb. Now while these infernal flies and mosquitoes are biting, sometimes life itself is thought to be a curse. This I know from actual personal experience. I have seen strong men shed tears of impotent rage at these innumerable and almost invisible enemies.

"Now, suppose you are with a miner's gum boots on reaching to your thighs, which are almost indispensable for traveling in that country during the summer season, each weighing 3 or 4 lbs., a heavy suit of woolen blankets, provisions for 10, 15, 20 or 30 days, often more; axe, pick, shovel and other necessary articles, aggregating in all 50, 60, 80, and often over 100 lbs., all on your back, wading through swamps, scrambling through underbrush, climbing steep hillsides, often in the blistering sun, which really and truly blisters, all the time the perspiration pouring off you in streams, and all the time the ubiquitous mosquito harassing you at every vulnerable point, giving closest attention to eyes, ears and hands. Such are the conditions the gold hunters of the Yukon must face."

Late reports from St. Michael's state that the Yukon River steamers left there two weeks ago for their last trip up the Yukon. It was not certain they would reach Dawson this fall, in which event passengers who left Seattle on the *Portland* as early as July 25th would only reach Circle City before navigation closes. This makes it certain that hundreds of miners who have left Seattle since August 1st, for St. Michael's, will have to winter there. All vessels touching at St. Michael's this summer have had great difficulty keeping their crews, who caught the gold fever very soon after arriving.

The San Francisco *Bulletin* publishes a letter from Charles Haines, its correspondent at Dawson, who wrote under date of July 26th. He says:

"Dawson is merely a collection of log huts, several stores saloons and about 600 tents. Lumber is high, and though the rigorous Arctic winter has already shown signs of closing in, there does not seem to be any great effort made among the tent owners to get themselves under better cover. When the long nights come, and the glass goes down to 65° below zero, there will be intense suffering here, and I shudder to think of it.

"Provisions are going to be very scarce, and there is little doubt that the entire town will have to go on short rations during the winter and that scurvy will be rampant. If we do not have early rains before the freeze-up, there will not be enough grub here to last through the winter, as the steamers cannot get through. To make matters worse, a number of pack trains have been coming in here from different parts of the county lately with only half the grub they started with. The packers foolishly sold or threw away their food to make their packs lighter, and I think they will suffer punishment for their folly before the ice opens next spring.

"There are few persons here who can be called poor, though of the 3,000 or 4,000 inhabitants only 200 at most have made big strikes. The less fortunate ones have found work in various capacities, and during last winter many made \$15 and \$20 per day, paid \$2.50 or less for living per day, and saved the remainder. But the town cannot stand a great many more newcomers unless new strikes are made. The man who comes in here this winter, should the floating population grow to any extent, must have money and food or he will run the risk of starving.

"Reports of other strikes are constantly received here, and many are authentic as far as Stewart and Pelly River are concerned, but nothing so rich as the Klondike has yet been reported. A man named Wilson took out several thousands of dollars on the Stewart River, but several expeditions have returned from there and reported that only fairly rich bar diggings exist on that stream. Many men are preparing to leave here for Juneau in case the steamers do not get through with provisions.

B. E. Janes, an assayer, who was in Dawson all the spring and half of the summer working for the Alaska Commercial Company, has returned. He left Dawson on July 17th and came down the river to St. Michael's. He states that \$300,000 is a liberal estimate for the balance of gold to arrive this year. The idea that every few days thousands are being taken out of the Dawson District is a mistake. A man will spend a year locating, burning and digging, and then when water comes sluice his dirt in a few days. In that period the gold is said to have been mined, whereas his year's time should properly be charged against it.

"Nearly all the gold not needed for the local business has been brought out, and there will be no more shipments of consequence until next June. I know of a case where a mine was purchased, and the purchasers tried to raise \$50,000 for the first payment on the best security. Only \$40,000 could be raised, and it was due to the scarcity of currency after the big shipments went out.

"The Yukon River is 3 ft. lower this season than it was last year at the same time. There has been an unusual scarcity of rain, though in July there was some. The steamer on which I came down the river, though light, grounded several times."

ARIZONA.

COCHISE COUNTY.

COMMONWEALTH.—The shoot from which most of the ore is being taken has been exploited for 400 ft. along the vein and for a depth of 300 ft. The ore body is found to vary from 16 ft. to 60 ft. in thickness. The lower grades of ore are reserved for treatment in a mill now being built. Monthly shipments will average 2,000 tons. No exact figures are obtainable, but there is authority for the belief that the monthly output of the Commonwealth is worth \$250,000. The gang is a ferruginous quartzite. In the upper workings the ratio of silver to gold was 2½ to 1, but in the deep levels it has gradually decreased until it is now even.

COPPER KING MINING COMPANY.—This company is carrying on extensive exploration work in its property at Bisbee, in which some good copper ore is already said to have been exposed.

GRAHAM COUNTY.

COPPER QUEEN CONSOLIDATED MINING COMPANY.—Judge Lacombe, of the United States Circuit Court, has granted damages against this company to the amount of \$8,666, to Pierre Manhes, for infringement of patents for the refining of copper mattes.

CALIFORNIA.

The Boston officials of the Pioneer Mining Company of California say that so far as can now be estimated the August output will equal that of July, when net earnings of \$6,659 were shown. The net yield for June was about \$9,000.

The governor having vetoed the appropriation for the regular reports of the California State Mineralogist, Mr. A. S. Cooper, the present State Mineralogist, is making plans to publish the most important statistical matter relating to the mining industry of the State in a more economical manner.

The California Debris Commission recently received new applications to mine by the hydraulic process from E. H. Adams, in the King Bird mine, in Yuba County, near Clipper Mills, to deposit tailings in Grizzly Creek, and from J. T. Coffman and George T. Miller, in the Lost Camp mine, near Blue Canyon, Placer County, to deposit tailings in Blue Canyon.

AMADOR COUNTY.

(From Our Special Correspondent.)

GOOD HOPE.—This mine, in Jackson, is said to be sold to the Gwin Mine Development Company for \$12,500. The mine was reopened last year and an incline shaft was sunk about 150 feet. The vein is small.

SHASTA COUNTY.

(From Our Special Correspondent.)

CONNOR.—This mine, near the Tower house, is being developed by a tunnel now in 250 ft. Some of the ore assays \$45 per ton in free gold. A mill will be erected at an early date.

MAMMOUTH-GARFIELD.—At these mines, in Old Diggings, 30 men are employed and 50 tons of ore are mined and daily carried to the railroad by the new Hallidie wire ropeway. The ore is then shipped to the smeltery of the Mountain Mines, Limited, at Keswick.

MCCARTER & TAYLOR.—On Soda Creek about two miles above the Tavern of Castle Craigs, near the mouth of Dan Lacey Gulch, a rich strike has been reported. Nuggets to the value of \$2,000 are said to have been taken out by J. L. McCarter, an old prospector who is one of the owners. Soda Creek has produced over \$100,000 in gold.

SISKIYOU COUNTY.

Dale Brothers are reported to have opened a body of gold bearing copper ore in the Butteville mining district.

TEHAMA COUNTY.

(From Our Special Correspondent.)

KESTENER & THOMPSON CLAIMS.—These mines, on Elder Creek, 30 miles west of Red Bluff, have been bonded to San Francisco parties for \$75,000. Work is to commence within 30 days. As the ore is refractory, they will probably erect smelting works. Assays are said to run from \$20 gold and silver and 220 pounds of copper to the ton upward. The ore is about the same as that of the Mountain mines of Keswick.

TRINITY COUNTY.

(From Our Special Correspondent.)

Duke Dean and party from Suisun are said to have purchased three claims adjoining the Blue Jay mine for \$9,000.

The Trinity Gold Placer Mining Syndicate, Ltd., owns about 5 miles on Union Creek, one of the tributaries of Coffee Creek, and has recently completed a large tunnel, 500 ft. in length, through serpentine rock in order to obtain the necessary fall for its tailings.

The town of Coffeetown has been staked out and several buildings are in course of erection. It is estimated that there are 2,000 people in the district.

It is stated that Graves Brothers & Carter have refused \$80,000 for the Blue Jay mine. The claims of Frank Bighouse on Big Boulder Creek, a tributary of Coffee Creek, have been bonded for \$25,000 to Wagner & Bodiker. There is both a quartz and a placer claim on this property.

BLOS & McCLEARY.—This hydraulic mine, at Trinity Center, and several other claims adjoining, are reported to have been sold to a Boston syndicate for \$275,000. The property comprises 900 acres of gravel claims. The intention of the new owners is to enlarge the ditches, put in an electric light plant, and work night and day. Hydraulic elevators are to be put in. The debris will go into the river.

COFFEE CREEK.—The Bonanza King mine, owned by Murphy and Burgess, is still producing rich ore. One pan is said to have yielded \$125, the average being about \$8. Not far from this claim in Hickory Gulch a new strike has been reported. The Carroll & Riley claim on Hickory Gulch has been purchased by H. Z. Osborne, of Los Angeles, for \$5,000. The same gentleman is said to have bonded another claim in Hardscabble Gulch for \$50,000; time, two months, cash \$1,000.

MCLEOD.—A large amount of development work has been done on this quartz mine on Coffee Creek, about 9 miles above Trinity Center. Several tunnels and crosscuts have been run and a wagon road is being built. A stamp mill has been ordered and will soon be on the ground. Some of the ore is very rich.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

BASIN.—This old mine, located on the North Fork of the Tuolumne River, has been reopened and the five-stamp mill repaired. The vein is from 1 ft. to 3 ft. in width.

DUNDERO.—This placer claim, 2½ miles east of Columbia, has produced some very rich nuggets during the past month. The one found a few weeks ago was worth almost \$2,000 and a later one \$800. The claim is being ground-sluiced and had been clearing \$1,000 per month even before these nuggets were found.

GOLDEN GATE.—This mine, one mile southwest of Sonora, has closed down on account of the water supply being shut off by the breaking of the Tuolumne County Water Company's flume at Middle Camp. Work will probably be resumed in a few days.

YUBA COUNTY.

PENNSYLVANIA.—This mine, in Brown's Valley,

has been unwatered by a San Francisco syndicate, of which C. H. Howard is the manager. Ore is now being raised from the 350-ft. level, which is said to assay \$8 to \$27 per ton.

COLORADO.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

Very little publicity is being given to the action of the owners of silver mines since the decrease in the price of that commodity. An impression is being given that it is not hurting these mines of Colorado. But it is a mistake. Certain portions of Clear Creek County have long been noted for the amount of silver being mined. Some three years ago most of the properties closed down, and those that continued mining had large bodies of the ore that could be mined at a much less cost. Within the past year some of these mines have been doing development work. Leasers were working the blocks of ground, and most of the miners were making day's wages. With the gradual decline the losses became heavier, and the companies have stopped all development and discharged their forces. The leasers will continue the getting out of the ore in the blocks of ground already being worked by them, but when this is completed something else will probably happen. There is no new work being carried on in the silver mines, and the going out of mineral now in sight will continue the product for some time to come. The Lamartine mine, which let out its force of silver miners, is working a few men on gold properties, but every one of the men let out found work in one of the gold mines at Idaho Springs. The output of silver ore from the Lamartine has exceeded three million dollars at current prices for that metal. The Georgetown and Silver Plume mines that have leasers working through the shafts are compelled to employ a few men, and these have been cut to \$2 per day.

CENTENNIAL.—This property is situated within the limits of Georgetown. In the sixth level from the shaft a body of mineral 10 ft. across has been opened, and it is claimed values run \$30 gold and 7% copper per ton.

FREELAND.—This property, held by the First National Bank of Idaho Springs, has been sold to the New York syndicate that is operating the Gold Coin and other mines of Gilpin County. J. C. Dickey is the superintendent. It is understood the amount paid was \$75,000. In the group are four claims—the Freeland, Toledo, Toledo Extension and Gladstone. The Toledo is one of the most promising, and work will be commenced on it at once. A deep shaft will be sunk, and the mine will be worked on as extensive a scale as those mines of Gilpin County, also owned by the syndicate, and which are now giving employment to 450 men. The shaft of the Freeland will also be pumped dry and some work commenced. This is the group of claims once owned by W. J. Mackey and Henry Rosener until they fell out a few years ago, and allowed it to run in debt and then be sold at sheriff's sale to satisfy the judgment. Under their ownership it produced \$3,000,000 worth of ore. The Freeland shaft was sunk to a depth of 1,100 ft., the last 225 ft. being off the vein. Searching for this ran the group into debt. With two powerful pumps working it will require about 60 days to clear the Freeland of its water; after that there will be very little expense, for the mine is not a wet one.

GRIFFITH MINING COMPANY.—Ore from the surface of this mine near Georgetown has shown wonderful improvement. From a shipment of 65 tons the average was something over 3 oz. gold per ton.

MAMMOTH GOLD MINING, TUNNELING AND RAILROAD COMPANY.—This company has been organized to drive a tunnel through the Alps Mountain, near Idaho Springs. It is estimated that within a distance of 5,000 ft. many of the biggest lodes of the district will be encountered. The greatest depth, however, will not exceed 1,500 ft. Water has prevented the extensive working of some of the lodes on this hill. The list of officers and directors of the new company embraces the following: Judge Henry and Hugh C. Ward, of Kansas City; Herbert S. Shaw, J. M. McMichael, W. H. Combs, J. J. Fleetwood, J. B. Andrews and A. J. Mayham, of Denver.

STANDARD GOLD MINING COMPANY.—The new mill at Idaho Springs has been completed and is now running on the ore taken from the mine. The mill treats the product by concentration and an attempt is made to save the values on eight Wilfley tables. They are adjusted for jiggling, which seems wrong, as their great worth is in the handling of alimes. Jigs were not added, which is also possibly another mistake, as they should suit this class of ore. However, the saving being made is almost as good as anything in the district, though great care has to be taken in the adjustment of these tables. It is claimed that the capacity of the mill is 80 tons of ore per day, but only about half this tonnage will be put through. The property was recently bought by a Pennsylvania company which paid \$70,000 for the group of Miller claims. The price is considered low, for in the group are nine promising lodes. Three air drills are in use, two in extending levels and one in stopping. The ore bodies are large and the mineral taken out in the development should keep the mill supplied. The average value is about \$12 per ton.

CRIPPLE CREEK—EL PASO COUNTY.

ELKTON CONSOLIDATED MINING AND MILLING COMPANY.—This company is the owner of three

patented claims on the southern slope of Raven Hill, comprising 17 acres. The Elkton vein traverses this property for a distance of 1,600 ft., and has been opened up for almost its entire length. The development consists of a main double-compartment shaft, sunk to a depth of 400 ft., together with drifts and levels aggregating over 8,000 ft. in length. Three levels have been run practically the entire length of the property, and the fourth for a distance of about 600 ft. At the fourth, or 400-ft. level, an extensive pumping plant has been installed. The shaft is equipped with adequate hoisting facilities, and the mine is furnished with an electric light plant, together with air compressors and drills. Previous to February, 1896, the Elkton Company has been engaged in securing its property and prosecuting development and thereby had incurred an indebtedness of \$9,000. During the succeeding three months, the company was enabled to pay off this indebtedness, together with a further sum of \$7,384 to the stockholders of the Walter, in accordance with the terms of a consolidation previously effected; and in addition to begin in the month of May, 1896, the payment of dividends amounting to \$10,000 monthly, or 1c. per share. This dividend rate was maintained until November, when the rate was doubled. The total dividends paid to July 31st, 1897, aggregate \$306,960 57.

The gross production from September 1st, 1895, to July 31st, 1897, amounts to \$80,274.89. Since January 1st the gross and net productions have been gross \$359,542; net, \$300,204. The cash surplus on August 19th, 1897, was \$242,064.07, to which should be added \$19,500, being the estimated amount of ore unsettled for by smelters making the total \$261,500. Of this amount \$124,316.50 are invested in United States bonds. At a point in the 400-ft. level, 180 ft. within the Walter lines, a raise was made to the 300-ft. level, all of which is in fine ore. So far as it has been opened up in this 400-ft. level the ore averages as high in grade as in any portion of the mine. A body of ore 4 ft. wide and averaging 1½ oz. has been opened up in this level south of the main shaft, and in territory where no ore of any value had heretofore been found. The Elkton Company is capitalized for 1,250,000 shares of a par value of \$1 each. Of these shares 250,000 remain in the treasury.

EL PASO CHLORINATION MILL.—The powerful engine of the new El Paso chlorination mill at Florence was started on August 27th, and a little later the machinery of the sampling mill was set in motion several carloads of ore being sampled during the afternoon. Everything worked to the entire satisfaction of the company. The plant is not quite ready for regular business, but will be in a few days.

ISABELLA.—The Isabella Company made a profit of \$2,800 in July. This was earned from a production of about 800 tons of ore, of which 230 tons was first-class and the remainder second and third class. The gross value of all ore was \$34,100, and the net value \$23,100. The expenses were \$20,300. The average value of the high-grade ore was about \$85 net. For several months past the shipments have averaged 250 tons. The company employs 150 men. When development work in and around the Lee shaft is finished, it may be possible to curtail expenses. The drift which was run over to the point where the rich Smuggler shoot should have been, developed nothing. A second drift is now being run in that direction. It will cut deeper.

WALKER CLAIM.—Eight carloads of ore have been shipped from this mine, of an average assay value, it is said, of \$65 a ton. The ore comes from a winze sunk from the 45-ft. drift at a depth of 65 ft.

(From Our Special Correspondent.)

GOLD DOLLAR.—This property, on Beacon Hill, was lately equipped with a new plant of machinery, a commodious shaft house and ore bins. It is preparing for heavy shipments of smelting ore.

GOLD STANDARD MILLING AND MINING COMPANY.—This company is doing very well from its Mount Monarch property, which is under lease to Messrs. Hoskins & Keith.

GROUSE.—This property, on Bull Hill, under lease to Keating Bros., is producing about 10 tons per day of medium-grade ore, and is also sending out an occasional high-grade shipment.

IRONCLAD.—Mr. C. P. Schumacher, well known in Leadville, has assumed charge of this mine. Shipments are temporarily suspended.

LAST DOLLAR.—Chas. Walden has charge of this mine, and produces its usual amount of low-grade ore, which goes to the Metallic Extraction Company, at Cyanide, for treatment, and to the Colorado smelter. Returns from some shipments are very high.

LEXINGTON GOLD MINING COMPANY.—This company owns the Clara D property on Gold Hill. Five veins have been opened and ore averaging \$40 per ton is being hoisted through three shafts. The recent development of the Schornburst vein, which crosses the Clara D. and Nellie V. belonging to this company, adds another shipper to this well-located group.

SHERIFF.—Len. Jackson is working this mine, on Raven Hill. He is one of the owners and has a lease on the remaining interest. Some time ago he took out several carloads of \$40 ore from a shaft he opened up near the Bogart. Operations were resumed in this shaft last week, resulting in the opening up of 4 ft. of smelting ore.

CUSTER COUNTY.

BASSICK.—J. C. Montgomery, recently appointed receiver of the Bassick, has filed his first report, showing the condition of the mine buildings, machinery, tools and equipment. He asks for permission to issue receiver's certificates to the amount of \$5,000. A great dump of tailings left by the mill in the early years of the mine operations possesses a present value and the receiver believes that from that old dump he can obtain all the money necessary to unwater the mine and put it in successful operation. The Bassick mine includes the Maine lode and mill site, the Triangle, Spring, Georgia, Frank and Nebema lodes and the Lookout mill-site. On the Maine is a new shaft-house 130 x 70 ft., with a Corliss engine of 640 H. P. There are other shaft-houses, buildings, machinery and supplies. When the mine closed in June, 1885, it began to fill with water immediately. The receiver estimates that the sum of \$30,000 will be sufficient to put the mine upon a paying basis.

DOLORES COUNTY.

(From Our Special Correspondent.)

NORTH STAR.—This property very recently passed into the hands of Messrs H. G. Corson, of Ouray, and C. L. Pritchard, of Aurora, Ill. Until recently it was under bond and lease to Mr. Corson and H. G. Sayles. The latter died a short time ago. The owners were E. A. Rush, M. Rush, Sr., J. J. Wade and Geo. Bauer. The lessees opened up paying bodies of low-grade mineral. The mine is well equipped with machinery, a mill of large capacity having recently been completed.

GILPIN COUNTY.

CENTRAL.—Denver people are working the mine under a lease. The shaft is down 100 ft., and a crevice carrying concentrating ore has been met.

GETTYSBURG.—This mine is now keeping one battery of stamps dropping day and night. The ore is low grade, but the vein is 6 ft. wide.

GOLD COINS COMPANY.—The output of these mines for the past month was \$24,000.

GOLDEN CLOUD.—The 300-ft. level, east and west is being driven, and so far shows a 2-ft. vein of shipping ore.

GOLDEN WEDGE.—A good body of smelting ore has been opened up. The assay is said to be 9-32 oz. gold, 21-30 oz. silver and 2½% copper.

GOLD ROCK.—Two shafts are pushing development work on the 600-ft. level.

LIVINGSTON.—Work has been resumed on this Fulton group mine. The shaft is down 100 ft., and the vein is fully 5 ft. wide at that depth. The ore is concentrating and carries a high percentage of lead. Eastern capital has, it is said, been invested.

NUCKET.—Sinking is being carried on in eight-hour shifts. The outlook is said to be favorable for a strike soon.

PHENIX.—This mine is still the largest producer in the county, turning out daily 100 tons.

PITTSBURG.—A depth of nearly 500 ft. has been reached with several drifts started a few feet. Large ore bodies are promised.

RANDOLPH.—Considerable interest is being taken in the sinking of the Randolph shaft, as indications are considered good.

REVIEW.—The new plant for this Winnebago Hill mine has arrived. The new shaft-house will be 30 x 56 ft., with a 32-ft. sheave frame.

TERROR.—This is perhaps the heaviest shipper in the Russell district.

TOPEKA.—Shaft sinking is going on, and for a short time the output is likely to be small. The amount mined daily is not above 15 tons of mill and smelting ore of fair grade. So soon as development shall have been further extended the Topeka is expected to again become a heavy shipper.

HINSDALE COUNTY.

(From Our Special Correspondent.)

ARMITAGE.—Geo. F. Gardner, who is operating this property, has paying ore in sight. The night shift has been withdrawn and added to the day shift, the augmented force being engaged in drifting each way on the vein. Work in the old tunnel has been indefinitely suspended.

GEORGE III.—J. N. Hull, of St. Louis, president of this company, has been inspecting the property. New machinery is to be put in at once and work resumed.

GOLDEN FLEECE.—The stockholders of this company met recently in Denver. The manager's report showed a net cash surplus of \$14,445.05 on hand July 15th.

HIDDEN TREASURE.—This mine is being reopened.

LOST TRAIL GROUP.—Mr. George C. Stevens, of Texas, has been appointed superintendent of this group. He has a force of 13 men developing it.

SILVER FLEECE.—Work has been recommenced and several men are drifting on the ore bodies each way from the bottom of the shaft.

SILVER STAR.—Six feet of good silver ore has been uncovered. Shipments will begin shortly.

LAKE COUNTY.

A number of the small leases have closed down on account of the low price of silver. None of the larger producers have yet taken this action, although there are rumors as to what is likely to occur if silver continues to depreciate.

All plans for watering the Leadville downtown mines have been abandoned on account of the fall in the price of silver. Mr. D. H. Moffat, who is the person most interested in these mines, declares that he will do nothing further in the matter until silver advances again.

(From Our Special Correspondent.)

ALZAR MINING COMPANY.—These people have the Donovan shaft down 405 ft. and are pushing work to get to a depth of 500 ft. At this point they will drift so as to have plenty of stopping room under their own ore body, which was opened up a short time ago through the Rattling Jack shaft.

BENTON MINING COMPANY.—The Minnesota and Park properties belonging to this company, in Adelaide Park, are being operated under lease. The lessees have opened up a nice streak carrying 25 oz. silver and 40% lead, with a small trace of gold.

BIG FOUR.—The traces of the fire that so seriously crippled these people a few months ago have been wiped away, and the entire surface plant has been rebuilt. Development work is being pushed, and the ore body opened up in a satisfactory manner. Regular shipments of good sulphides are being made.

FANNY RAWLINGS.—The strike made by the lessees of this property has opened up very nicely. The ore body is now 5 ft. thick. The ore is an iron oxide carrying 2½ oz. gold, 55% iron, 15% lead and 5 oz. silver. The ore in some places has assayed as high as 8 oz. in gold; this ore has been sacked. The bins are filled to overflowing with the average grade as first mentioned, and shipments to the smelting works were commenced on September 1st. About 15 tons a day will be shipped. It is the opinion of the lessees that they have the extension of the Johnnie ore shoot, and in addition to operating the ore body they are now prospecting and carrying on considerable new work in virgin ground.

HILL TOP.—The ore shoot is opening up better every day. About 100 tons of lead ore are being sent down the tramway each 24 hours. A new find is said to run very high in gold.

HOLY CROSS SECTION.—There is considerable activity as a result of the cyanide mill put in by the company. The capacity of the mill is 75 tons a day. There are 75 men at work in the mine, and a great deal of important prospecting and development work is being carried out by the management.

LONE HAND.—This property is in Lackawanna Gulch, and should begin shipments to the valley smelting works in a short time, as the bins are now full. The ore assays well in gold and copper.

RUBY.—The ore body is known to be large, and shipments have been increased. It is understood that arrangements have been made for the sinking of a new shaft, and that work is to be commenced at once. This shaft is sunk for the purpose of facilitating the handling of the ore.

YANKEE DOODLE.—This property has resumed operations. After receiving part of their pay the men still have \$3,500 due, but arrangements have been made by Mr. Balcom, of Denver, the Western representative of the company, whereby the men are to operate the property for themselves, and after paying all expenses the balance is to be divided among them in paying the wages due. There is a good body of iron ore to work on, and before the end of the week the property will be shipping about 50 tons a day to the Globe Smelting Works in Denver.

LA PLATA COUNTY.

(From an Occasional Correspondent.)

The La Plata mining district is a very promising locality. The lodes are strong, cutting through the mountain from one side to the other. The Little Jane vein shows a 20-in. streak of \$270 ore.

COLUMBUS.—This mine is reported to have a fine body of ore showing in the first and second levels, especially in the latter. These levels are 50 ft. apart. During the coming winter the shaft is to be sunk 150 ft. deeper to open a third level.

(From Our Special Correspondent.)

BLACK DIAMOND.—Elkburg Bros. are pushing development. The tunnel is in 80 ft., with a 20-ft. crosscut on another vein on the same ground. The claim is in close proximity to and runs parallel with the Little Jane, the ore also being of a similar nature to that of the latter.

DAISY.—Wm. Orr is driving west on the Hibernia vein and has good ore. The tunnel is in 85 ft. and shipments will begin as soon as ground for stopping is opened up.

DURANGO GIRL.—Leiner & Co. have shipped a three-ton lot to Durango, which it is said gave returns of \$232.20 in gold and \$122.40 in silver per ton.

FLY WHEEL.—Fifty sacks of ore have been sent to Durango for a test run, which, if satisfactory, will insure large and regular shipments during the remainder of the season.

FREDERICKTON.—J. B. Hardin, of Boston, Mass., has purchased Mr. Kern's interest in this property in Burnt Timber gulch, and is taking steps to secure a U. S. patent on the same.

GOLD BOND.—Ore has been found, mill runs from which give \$48.90 in gold and \$62 silver per ton. The mine is owned and worked by Fuqua & Flood.

GOLDEN ROSE.—B. Kerns recently made a 5-ton shipment of gold ore to Durango and will continue

regular shipments during the remainder of the season.

JOE GRAFF.—Mettler & Nichols are driving a crosscut toward the vein, which is now in 235 ft., with only a few more feet to drive before the objective point is reached. The crosscut cut the Hibernia vein in good ore.

LA PLATA MINING DISTRICT.—This new mining district, situated partly in La Plata and partly in Montezuma counties, in southwestern Colorado, is attracting considerable attention. Much of the ore produced is being shipped to Durango smelting works. Most operators, however, are only shipping enough ore to pay the expense of development.

LILY BELL.—First-class gold telluride ore has been discovered in this property.

LITTLE JANE.—A consignment of three tons of rich ore was recently shipped to Durango smelting works. It gave \$269.60 per ton gold. This was float ore.

MOUNTAIN LILY.—Ore has been found in this claim by Shively & Boyle, which it is said gave mill runs of \$1,280.60 per ton in gold.

PITKIN COUNTY.

YELLOW BOY MINING COMPANY.—At the recent meeting it was decided to lease this company's property adjoining the Tam O'Shanter and Montezuma mines, above Ashcroft, to Oakland & Jones. The lessees will extend the tunnel started on the Pine Creek side of Slate Mountain through to the Montezuma line.

SAN JUAN COUNTY.

SILVER LEDGE.—A 50-ton mill is in course of construction at this mine, which is situated two miles below Red Mountain.

SUMMIT COUNTY.

There is much activity in lode and placer mining at Breckenridge. The Sisler placer, which has been worked more or less continuously for 27 years, is said to be doing particularly well. At Kokomo and Robinson there is less activity; the pyritic smelter at Kokomo is idle.

GEORGIA.

WHITE COUNTY.

LOT No. 10.—Mr. J. T. Whitner, the owner of this lot in the third district, intends putting in a 20 stamp mill. A ditch seven miles long is to be dug.

IDAHO.

BOISE COUNTY.

OLD GLORY MINING COMPANY.—This company is now operating several properties on Squaw Creek, among them the Liberty which produces gold, silver and copper. For the past year the company worked the Big I at De Lamar, successfully.

IDAHO COUNTY.

GREEN CREEK MINING COMPANY.—A contract has been let for the driving of a 300-ft. tunnel on the Idaho vein across Clearwater. Mr. Rickards will have charge of the work. The new tunnel will be driven on the vein. The ore is said to run \$85 a ton in gold.

OWYHEE COUNTY.

(From Our Special Correspondent.)

SOUTH MOUNTAIN CAMP.—The mines in this camp, 18 in number, have been transferred to the Spokane & South Mountain Mining, Milling and Smelting Company, of Spokane, Wash., which has been organized to work these silver-lead properties. The camp is 25 miles southwest from Dewey and about 28 miles from the De Lamar and Silver City mines. Some of the claims were worked years ago by W. C. Ralston, of San Francisco, but upon his death they passed into other hands. The assessment work was kept up until last year, when most all the claims in the district were consolidated. The croppings of the main ledge cross a series of high hills and intervening ravines for a distance of 10,500 ft., thereby furnishing fine tunnel sites. Several are now being run; the main one on the Grand Central is to be extended 4,000 ft. at an average depth of 800 ft. from the surface. It will tap from 20 to 30 ore shoots. The walls of the main ledge average about 100 ft. apart, and the ore shoots of galena and lead carbonates sometimes run diagonally across the ledge from wall to wall, and at other times follow one of the walls. The smaller veins which come in from either side vary from 5 to 15 ft. in width. The assays average 40% lead and 100 oz. silver per ton. Cost of mining, hauling, freight and smelting is \$2 per ton. The total output of these mines has been \$1,500,000 up to date.

SHOSHONE COUNTY.

IDAHO ANTIMONY MINING COMPANY.—This company is erecting a liquating furnace of 10 tons capacity per diem. The concentrated regulus thus obtained is to be shipped to antimony smelters for reduction to metal.

MORNING.—This mine, at Mullan, has been purchased by Messrs. Greenough & Larson, who have been operating it under lease for several years. The price paid is said to be \$300,000. At present about 250 men are employed in the mine and dressing works, and from 2,300 to 2,500 tons of silver-lead concentrates are shipped monthly.

MAINE.

HANCOCK COUNTY.

A vein of molybdenite has been discovered on the property of Charles H. Emery, of Ellsworth, Me. It is proposed to open a mine.

MICHIGAN.

COPPER.

In respect to the rumored consolidation of Osceola, Kearsarge and Tamarack, Jr., the Boston News Bureau says that the managers of these properties so far from having made any figures, have not yet considered any one of these properties in respect to placing a value upon it for consolidation purposes.

CENTENNIAL.—President Tav, of this company, is quoted as saying that the mine will be producing copper by next January. The stamp mill is now ready to begin crushing. The Calumet conglomerate is being explored and so far indications are favorable.

FRANKLIN, JR.—The Copper Journal, Hancock, Mich., publishes in a recent issue a detailed account of this mine, the result of a careful observation by a representative of the paper. Captain Clymo, is quoted as saying that the lode at that mine is wider and stronger than either the Pewabic or the Quincy was at the same depth, besides being more uniform.

ISLE ROYALE.—The compressor and boiler houses are being built and it is expected all will be in readiness to set the pumps to work as soon as they arrive. One hundred men are employed and all improvements are to be finished before winter.

TECUMSEH.—Mr. Graham Pope, manager, has instructions to open the Osceola and Calumet veins at some new point. In accordance with these instructions he has already sunk 390 ft. at a point 4,200 ft. from No. 6 shaft on the Osceola. The length of the Osceola lode on the Tecumseh is 3,300 ft. From time to time in sinking this shaft some fine copper has been found, but never in paying quantity. The character of the rock is exactly the same as at the Osceola mine. It is thought that copper will be found in this lode in paying quantity at a greater depth. The capacity of the machinery is limited and is only fit for exploring. About 28 men are being employed. For the last six months expenses have averaged \$1,967 per month. An assessment of \$40,000 has been called for, and about one-half is paid.

IRON—GOGEBIC RANGE.

NEWPORT.—This mine, as well as the Bonnie, a neighboring property, is reported to have been sold to Ferdinand Schlegelinger, of Milwaukee, and Mark Hanna, of Cleveland.

PROTECTION.—The Illinois Steel Company is said to be negotiating for this property, at Iron Mountain.

TILDEN.—A rumor has been current for some days that this greatest of ore producers of the Gogebic range, has been sold. The Carnegie-Oliver syndicate is said to be the buyer, and color is given to the statement by the previous purchase by the same associates of the Mountain iron mine, Mesabi range. The Tilden has been the heaviest producer of the group owned by the Penokee & Gogebic Consolidated Company, in which company Mr. Rockefeller is a large shareholder. During the past week work has been resumed at the Tilden, and it is given out that many additional men are to be set to work. It is understood that the lease under which the Tilden mine will be worked is similar to that under which the Mountain iron mine is now operated, the Rockefeller interests receiving in return a large tonnage for their fleet of lake vessels, and the lessees guaranteeing a large annual output. The figures given for the annual output which Mr. Carnegie agrees to make are 300,000 tons. The amount of money involved in the transaction is said to be \$1,000,000.

IRON—MENOMINEE RANGE.

CHAPIN MINING COMPANY.—This company is watering the lower levels of the Ludington mine.

CRYSTAL FALLS.—This mine has resumed with a new force, the old employees refusing to work at the reduced wages offered.

MINNESOTA.

(From Our Special Correspondent.)

The records of iron-ore shipments from the great lakes were all broken by Two Harbors last week, when 58 vessels were loaded, and 180,000 tons of ore were sent out. In one day 14 vessels, carrying almost 50,000 tons left the port. Such a movement has not been known in the history of lake navigation, and the Two Harbors season's total may yet reach 3,000,000 tons, as was at one time anticipated. The largest load taken during the week was also the largest cargo ever carried on the lakes by any sort of vessel, and exceeds the steamship record by 165 tons. It was taken by the new steel steamship *Empire City*, built by the Cleveland Shipbuilding Company and owned by the Wolvin syndicate of Duluth. The cargo was 6,234 net tons, besides 150 tons of fuel, and was carried on a draft of 17 ft. 11 in. forward and 17 ft. 5 in. aft. The ore was Fayal and was taken to South Chicago.

Men for new work at the mines and railroad extensions on the Minnesota ranges are scarce, and in most cases wages have been slightly advanced the past week. Many hundred men have gone from the district to the harvest fields of Minnesota and the Dakotas, or to the mines of the far West.

ITASCA COUNTY.

LITTLE AMERICAN.—The Little American mine is situated about half a mile west of Rainy Lake City on the American side of the international boundary. The property is owned by the Bevier Mining and Milling Company, of Duluth, and is leased by the Lyle Mining Company, whose headquarters are at

Calmar, Ia. Two shafts have been sunk on the property, one 98 ft. and the other 140 ft. A 20-stamp mill is being erected with steam hoists, pumps, etc.

IRON—MESABI RANGE.

ARCTURUS IRON COMPANY.—Work at this mine has been suspended for a time to await tests of the ore. A carload was sent to the Illinois Steel Company, which has an option on the mine at \$100,000. The mine has been explored sufficiently to give an idea of the size of its ore body, and all the prospective buyers wish to know is the quality of the ore. Officials of the Illinois Company have been in charge of the explorations, it is understood. The mine is 12 miles from a railway, and nothing more will be done, should the tests prove satisfactory, until a spur has been built to it.

BIWABIK BESSEMER COMPANY.—This company is shipping about 7,500 tons of ore daily, in an endeavor to get its contracts closed this fall.

DULUTH.—At this mine, the property of the Consolidated mines, the stripping of 20,000 yds. has been finished, and the contractor has removed his material.

LAKE SUPERIOR MINES.—At these properties of the Consolidated Company, work is going on briskly, and the stockpiles of the Burt and Hull are being cleaned up. The Rust is to be opened as an extensive shipper, and the surface buildings are nearly complete. The Hull is very busy, and 90 cars a day are going from stock and 25 more from underground, all of a very high grade. About 150 men are employed.

MAHONING ORE COMPANY.—At this mine the stripping contractors, Winston and Dear, have already put one shovel on the new 400,000-yd. contract, and next week will have another. They are working 150 men, and will continue this programme all the winter.

MOUNTAIN IRON.—At this mine, despite the enormous area stripped, the work is still going on, and test pits are being made outside the stripped area to determine how far the ore body continues.

PILLSBURY.—The Rockefeller Company, which purchased this mine a year ago for \$400,000, will begin operations this winter.

ROBERTS.—About 50 men are at work and ore is being shipped regularly. The ore is finding a ready sale at a good price, and the mine will be extensively operated next year.

SPARTA IRON COMPANY.—This mine has made a small shipment of ore, but will do little else this year than push stripping and development for another season.

IRON—VERMILION RANGE.

BROWN-MILLER.—A carload of machinery and pumps has been taken to this property. It is known as Section 26, and has been under exploration for several years. The vein is an extension of the Zenith lode, and is said to have shown up remarkably well. The ore is soft, running well in iron and low in phosphorus. It is much like the Chandler ore.

CHANDLER IRON COMPANY.—This company has shipped so far about 360,000 tons, and still has in its stockpile some 125,000 tons, which it will send out as fast as possible. Mining is only by day shift, but night crews will be set to work.

MINNESOTA IRON COMPANY.—The Montana shaft at the Sudan mine has been abandoned, and the machinery is being removed. A drift has been cut from this shaft to No. 8, and the Montana ore will be hoisted through No. 8. Loading at the Vermilion grade stockpile has been much hindered during the past few days by the large body of ice encountered there; it is so solid that steam shovels cannot break it. The pile is the accumulation of four years.

WALSH MINE.—Work on this property, two miles east of Tower Junction, is progressing rapidly, and at a foot from surface ore was struck by the development crew. Analysis proves it to be an excellent grade of magnetite. The deposit is extensive, and lies close to the line of the D. & I. Railroad.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The past week has been favorable for the production of zinc ore, as all the operators were working steadily. The sales of ore show an increase of four cars of zinc, but lead ore shipments were two cars less than during the preceding week. Thirteen cars of Joplin zinc ore, and the Springfield, Stotts City and Alba products of zinc ore sold at \$23 per ton; four cars of Joplin zinc ore, and the Oronogo product, sold at \$22.50 per ton. Lead ore began the week at \$23.25 delivered, advancing 50c. on Friday, and closed the week in demand at \$23.75 per 1,000 lbs., an advance of \$9.50 per 1,000 lbs. over the corresponding week of last year. Zinc ore sold during the corresponding week of last year at \$19.50 per ton for a few choice lots, a gain for 1897 of \$3.50 per ton. The increase of the district sales over those of last year was 58 carloads of zinc ore, while there was a decrease of two carloads of lead ore. There is very little surplus zinc ore in the district, and only 1,000,000 lbs. of lead ore left over. Following are the sales of lead and zinc ores for the week ending August 23th:

Joplin zinc, 1,711,730 lbs.; lead, 329,800 lbs.; value, \$26,663. Carterville zinc, 1,185,820 lbs.; lead, 121,360

lbs.; value, \$14,725. Webb City zinc, 544,220 lbs.; lead, 21,460 lbs.; value, \$6,513. Galena zinc, 3,031,000 lbs.; lead, 406,130 lbs.; value, \$36,814. Aurora zinc, 765,000 lbs.; lead, 35,000 lbs.; value, \$6,672. Stotts City zinc, 171,940 lbs.; value, \$1,977. Oronogo zinc, 86,950 lbs.; lead, 32,920 lbs.; value, \$1,730. Alba zinc, 84,970 lbs.; value, \$954. Springfield zinc, 58,400 lbs.; value, \$667. Belleville zinc, 28,780 lbs.; lead, 5,460 lbs.; value, \$442. District totals for last week: Zinc, 7,717,410 lbs.; lead, 955,500 lbs.; value, \$97,157. District totals for 35 weeks: Zinc, 223,497,480 lbs.; lead, 37,566,090 lbs.; value, \$2,851,771.

BIG EIGHT MINING COMPANY.—These associates, on the Joplin Prospecting Company's lease, are drifting at 142 ft., on a 50-ft. face of lead and zinc ore, in hard ground, with very little water. Last week they broke the record by clearing over \$1,000 for the six days work.

BOB MOORE MINING COMPANY.—On the College Hill lease a shaft is being sunk on the head of the drift where a large face of ore has been developed. The new shaft was necessary for ventilation and also to avoid an old cave-in near the ore body.

FRANK YALE.—The ore was struck at 64 ft. and now at 84 ft. the shaft is still in rich ore.

GRONDS & IRWIN.—These operators have moved their concentrating plant about 200 ft. to solid ground. They will start up and make a good output of ore this week.

HORSE SHOE MINING COMPANY.—This company has a lease on six acres of the John H. Taylor land. It has just completed a fine large concentrating plant that will handle 350 tubs during nine hours. Drifting is being pushed at 145 ft. on a larger face of zinc ore in shooting ground, and enough dirt has been broken to run the plant for 30 days.

JAMES WATSON & COMPANY.—This company, working in Lone Gulch Hollow, is making about 8,000 lbs. of lead ore, and 2 tons of zinc ore weekly. It cleans up on two hand gigs. Drifts are being run at 70 ft. and an 8-in. lift-pump is kept running steadily, as the water is strong.

LOCUST MINING COMPANY.—This company, on the Granby land, is drifting at 110 ft. on a good run of lead dirt, which is cleaned up on the concentrating plant owned by the company. The production is over 20,000 lbs. of lead ore weekly. A good face of zinc ore shows at 147 ft., though it is not being worked at present.

RED HEN MINING COMPANY.—On the Granby land, west of Joplin, this company has developed a rich face of lead and zinc ore in hard ground, with enough water to wash the ore, and will make its first turn-in this week.

REX MINING COMPANY.—The company's land is coming to the front as a lead producer. The output has been increasing every week, and last week they made 102,500 lbs.

YELLOW DOG MINING COMPANY.—This company is hoisting rich lead dirt from two shafts. Last week shaft No. 1 made 17,000 lbs. of lead ore and No. 3 made 26,000 lbs. The ore is found in the 60-ft. level in open ground.

MONTANA.

The next two weeks will witness many changes in the mines of Northern Montana. The first day of September is the date set in several districts for closing down or for the retrenchment of expenses in a number of silver mines in this part of the State. Neither will suffer to no inconsiderable extent and Barker will also feel the effects of the recent slump in the white metal. The general closing down will not, however, materially affect Great Falls, as the silver-lead smelter there has on hand contracts for ore sufficient to keep the plant in operation for several months. Fort Steele ore is arriving in a greater quantity than ever. After September 1st an extra ore steamer will ply the Kootenay River with ore from the North Star and other British Columbia mines.

FERGUS COUNTY.

GOLDEN JACK MINING COMPANY.—L. S. Woodbury, the manager of this company, has let a contract for 100 ft. of tunneling on the Cone Butte properties. The tunnel is to be 4½ ft. x 6 ft.

NEW YEAR.—This group, consisting of the New Year, Gibson, Virginia and Ralph quartz lodes, was owned by W. G. Norman and A. D. Harmon, was recently bonded to W. deL. Benedict for \$75,000 in the interest of New York parties. The bond further states that Benedict is to have a suitable mill erected on the property before May 15th, 1898, and that he is to pay Norman and Harmon 50c. per ton royalty on all ore taken out, this to apply on the purchase price, and that after May 15th, 1898, the amount paid monthly for royalties is not to be less than \$1,500. Mr. Benedict also bonded from B. E. Vincent the Butte lode, which adjoins the New Year group. The total price is fixed at \$8,000, and the final term of the bond is January 1st, 1899. Mr. Benedict at once put a crew to work on the properties, in charge of B. E. Vincent.

FLATHEAD COUNTY.

A 60-ft. quartz ledge is reported to have been uncovered at the hydraulic works on Lioby Creek, and there is some excitement over the discovery. The ledge is said to be the most extensive yet discovered in that locality, and prospects well in gold.

JEFFERSON COUNTY.

EUREKA & SANSFIELD.—Messrs. Kennedy & O'Neill, of Butte, who bonded these claims for

\$40,000, have not yet gone to work. They will forfeit the bond if they do not break ground soon.

GOLDEN BAR.—This mine has been leased by the Loomis Brothers and Thomas Jones, who have four men on the property taking out ore, which carries gold, silver and lead.

KIT CARSON.—John and Fred Fisher have leased this mine, on Lowland Creek. They have already commenced operations.

MAYFLOWER.—A rich body of ore was recently found in this mine. It is 6 ft. wide, and is said to assay over \$200 per ton, and has been opened up to a length of 80 ft.

WAKE UP JIM.—Lack of water has caused operations to be suspended at this mine for the season.

LEWIS & CLARKE COUNTY.

BOSTON & MONTANA.—Mr. John Bordeaux and his associates are down 250 ft. on the Meaderville claim. If no ore is found the syndicate will have spent \$50,000 in vain.

COMBINATION.—The pumps were pulled in this mine a few days ago, and all machinery hauled away. A large sum has been spent without any return. The shaft was down 410 ft.

LONE PINE.—This group is ¼ miles north of the Republic, and belongs to the same owners. The main tunnel is in 150 ft., and drifts are being run. The ore improves as depth is gained.

MERRIMACK.—William M. Morris, William Shure H. S. Thurber and John Hagan have commenced action in the District Court against Col. W. M. Wherry, the commander of Fort Harrison. The complaint alleges that the plaintiffs have been the owners of the Merrimack quartz lode since 1892, but that Colonel Wherry ejected them on August 8th. It prays judgment for \$1,700 damages and possession of the claim. The ground involved in the controversy is included in the Fort Harrison reservation.

REPUBLIC.—The order for the mill to be built at this mine is to be given out immediately. Messrs. Clark and Kingsberry have been examining the cyanide process now being used in treating the tailings of the Drum Lummon mine. So far they have been satisfied with all tests made on Republic ore. Grading for an 8,000-ft. flume has just been finished. Machinery for a saw mill will be in position soon, and then the flume lumber will be sawn. No. 1 shaft is down 140 ft. on the vein, No. 2 is down 40 ft., and is situated 250 ft. north of No. 1. A tunnel connects the two shafts. Drifts north and south have been started. A third shaft to be sunk 275 ft. is now down 30 ft.; this will be eventually the main working tunnel.

MADISON COUNTY.

GALAXY.—The incline is down 80 ft. in an 18-in. seam of rich ore. The new hoist, engine and Blake pump are giving great satisfaction. The output is very steady, and all goes to the Helena smeltery.

GARNET MINING COMPANY.—This company is working the Galena group of claims at Pony. A 20-stamp mill has been erected.

HAWKEYE.—This mine is owned by Traffler Burns & Walker but is now being worked under lease and bond by the Montana Mining and Smelting Company. The vein is 8 ft. wide and the present capacity 15 tons a day. It is expected, however, that by sinking to 175 ft. and crosscutting the output can soon be made 50 tons.

LINCOLN.—The Montana Mining and Smelting Company is working the Lincoln under lease and bond. Five distinct ore bodies have been found. The value of the ore is largely in its lead. The mine, is being opened by an incline, an adit and a vertical shaft. The tunnel shaft was a 4-ft. vein. The management claim to be able to ship 25 tons a day.

LONGFELLOW.—The Montana Mining and Smelting Company has bonded this mine and is putting in engine, hoist and pump.

MASCOT.—Ore from this mine is being reduced at the East Helena Smelting Works.

MONITOR & MERRIMACK.—A test run of 26 tons is being made in Pritchell & Company's mill, on Bear Gulch.

PRITCHELL & COMPANY, A. P. A. MILL.—This mill is able now to keep running continuously to its full capacity.

SUNNYSIDE.—This group of mines has been purchased by the Rocky Mountain Exploration Company of London, for \$30,000. It is said the company will erect a small mill. The ore is gold bearing.

THISTLE MINING AND MILLING COMPANY.—J. K. Clark is pushing the construction of his new mill at Rochester. He expects to have it built by September 15th.

(From Our Special Correspondent.)

BIESINGER AND BECK MINING COMPANY.—This is a new Utah incorporation with head office at Salt Lake, where reside the directors. The secretary-treasurer is Mr. Fred Keller. The property consists of Atki, Zebra and Utah Northern lode claims in no organized mining district. Nearest post-office is Pinta Springs. Some considerable development is accomplished and a car of ore recently shipped returned \$110 per ton; about ¼ gold, remainder silver.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

ALICE GOLD AND SILVER MINING COMPANY.—The management has concluded that it is more advisable to work this property than allow it to

remain idle, although the low price of silver reduces the profits. At the Valdimere considerable development work is in progress, and it should open up extensive ore bodies. About 100 tons of ore is hoisted daily.

MONTANA ORE PURCHASING COMPANY.—This company brought suit in the District Court, August 24th, against C. S. Batterman, a mining engineer, formerly in its employ, charging him with betraying its mining secrets to the Boston & Montana and Butte & Boston mining companies, the defendant's present employers. The complaint sets forth that Batterman, while in the employ of the Montana Ore Purchasing Company, made surveys and maps of the Rarus and Glengarry mines, and while occupying a confidential position as civil engineer, he furnished the Boston & Montana Company with information regarding the Montana Ore Purchasing Company's mines, ore bodies and veins, particularly those of the Rarus; furnishing maps, tracings and prints, made from notes taken while in the plaintiff's employ. Judgment is asked for the return of the maps or their value, which is put at \$1,000, and also for \$1,000 damages for their wrongful detention and use. The Boston & Montana Company is also made defendant in the suit. A second suit is begun in which the Boston & Montana company alone is made the defendant. The complaint charges that the defendant company has extracted about 1,000 tons of ore valued at \$5,000 from ground in the Faucet addition owned by James Cassidy, who conveyed all his interest in the said ground to the Montana Ore Purchasing Company, and also the right to recover for all ores which have been extracted by any person. Judgment is asked for \$5,000 against the Boston & Montana Company. The Montana Ore Purchasing Company, through its attorneys, John J. McHatton, of Butte; Corbett & Clayberg, of Helena, and Wolcott & Vail, of Denver, demands a trial on September 20th of the two suits entered against it in the United States Court, one by the Boston & Montana Company for \$500,000 damages for ore alleged to have been extracted from the Pennsylvania claim through the workings of the Rarus; the other by C. Rollins Morse for \$150,000 for ore extracted from the Michael Davitt claim also through the workings of the Rarus.

SWEETGRASS COUNTY.

OREGON GROUP.—A half interest has been bought by John A. Smith, and 20 men are now employed. A contract has been let for running a 200-ft. tunnel. The ore is free milling, and will run, it is claimed, about \$15 to the ton.

PLYMOUTH GROUP.—Congressman Hartman is interested in this group. It is showing up well. The tunnels driven aggregate 800 ft.

NEVADA.

ELKO COUNTY.

DEXTER.—Gold ore averaging when crushed, it is said, \$125 per ton, is being taken out of this mine, and it is claimed even a higher grade of quartz will soon be sacked for shipment.

GOLD CREEK.—Major Joseph L. Robertson, president of the Gold Creek Mining Company, has returned to New York after a six weeks' visit to the Nevada gold field. He was favorably impressed with the outlook.

ESMERALDA COUNTY.

(From Our Special Correspondent.)

BIG INJIN.—In this mine, near Coryville, 12 miles from Hawthorne, a rich strike has been reported. For a number of years little work had been done, but recently William Watson has been working the property under a lease. He ran a tunnel 400 ft., uncovering a 4-ft. ledge of very rich ore. This property is owned by W. D. Tobey, of Carson; Senator Forbes, of Hawthorne, and Colonel Boyle, of Gold Hill, Nev.

STOREY COUNTY.

SILVER PEAK.—The contest over the ownership of this mine has been settled, John B. Mackay and his associates remaining in possession.

WASHOE COUNTY.

HUTCHINSON COMPANY.—The Hutchinson Company, of Olinghouse canon, near Wadsworth, cleaned up the first 12 tons of placer dirt run through the sluice boxes and obtained a return of \$207, or a little over \$17 to the ton. The company has two shifts on the Hutchinson shaft and tunnel and proposes to push development work as rapidly as possible. Samples of the ore from both sides of the shaft, from the grass roots down to the depth of 40 ft., were taken, getting them every few inches, and they averaged over \$30 a ton, and one sample taken at a depth of 28 ft. went \$500. The company has begun a 200-ft. tunnel to connect with its shaft.

NEW MEXICO.

The coal product of this Territory in 1896, according to the report of the United States Mine Inspector, was 733,530 tons.

COLFAX COUNTY.

RATON COAL AND COKE COMPANY.—A reduction of 10% in the miners' wages has been announced, to take effect September 1st. The price now paid for mining is 65c. per ton.

GRANT COUNTY.

TEXAS.—This mine has been purchased by Mr. H. Niles as the negotiator of a syndicate of wealthy Philadelphians, which is said to be made up as follows: Barclay H. Warburton, publisher and pro-

prietor of the *Evening Telegraph*; Thomas M. Thompson, director of public works; John M. Mack, of the Vulcanite Paving Company; Select Councilman Edward W. Patton, Assistant City Solicitor Simson Gratz, James P. McMichael, James H. Mundy, Michael O'Rourke, Thomas J. Ryan and A. H. R. Morrow. The ore of the Texas, while mainly valuable for its silver, carries a high percentage of gold. A concentrating mill will be built, and a large amount of exploration and development undertaken at once. A deal has been made between the purchasers and the Bayard Smelting and Mining Company, owning some 14 other claims in the immediate vicinity of the Texas, by which all the properties are to be worked jointly by one company. The claims owned by the Bayard Company are said to run well in copper, lead and gold.

SIERRA COUNTY.

GOOD HOPE & BONANZA MINING AND MILLING COMPANY.—The reduction works of this company at Hillsboro were destroyed by fire on August 26th. The works had been running steadily since their construction in 1890. About 800 tons of ore which were on hand will have to be treated elsewhere.

PENNSYLVANIA.

ANTHRAHITE.

CENTRALIA.—This new coal breaker is now being built, and when completed will, it is said, be the largest in America.

BITUMINOUS COAL.

The Pennsylvania Coal Company is about to widen the No. 6 shaft at Inkerman by 5 ft., and to sink it another 300 ft., from the Pittston seam to the Red Ash.

Coal operators seem to be confident that the strike will be settled very shortly, and that the men will return to their work, accepting 64c. a ton in the Pittsburgh district, pending arbitration. T. E. Young, manager for M. A. Hanna & Company, has been working for such an agreement ever since the failure of the Pittsburgh conference, and it appears that he and Ratchford have almost come to an understanding. This proposal means that should the miners return to work they would get 10c. a ton more than they have been receiving with the possibility of their being paid 60c. a ton as the result of arbitration. Should the strike be brought to an end on these terms it would mean that 125,000 miners are to receive an addition of \$13,443,197 to their wages each year. The miners would have gained much, but not by any means all they had asked. When the arbitrators meet, provided the proposal mentioned in the foregoing be accepted, they will be required to fix a price between 60 and 69c. a ton. Many small operators were said to have been willing to pay the 60c. demanded by the men, but the slim representation at the St. Louis conference caused them to retract, and they are now believed to be willing to co-operate with the large operators.

SOUTH DAKOTA.

CUSTER COUNTY.

Encouraging reports have been received from the mica mines on French Creek, six miles east of Custer City, formerly owned by Miller & Wooly, of St. Louis, Mo. The property is now owned by a St. Louis company. P. H. Clarke is in charge of the property, and has six men at work.

LAWRENCE COUNTY.

It is reported that seams of coal from 3 to 6 ft. thick have been discovered in the Black Hills.

ANNA CREEK MINING COMPANY.—The erection of the new cyanide works for this company, at Anna Creek, will be begun presently. In the meantime the company is doing a good deal of exploration work in the mine, which is claimed to show a large amount of \$30 ore.

BUXTON.—This company is shipping considerable ore from the Bonanza mine to the Deadwood & Delaware Smelting Works.

DEADWOOD & DELAWARE.—This company is getting a good deal of ore from its Union mine.

GOLDEN REWARD.—This company is reported to be shipping 160 tons of ore per diem to the chlorination works at Deadwood; also a large tonnage of silver ore from the Stewart mine to the Omaha & Grant Works at Omaha.

RAGGED TOP.—Several new strikes are reported at this mine in the Black Hills, one that is said to promise well being on the Uister claim.

TENNESSEE.

BRADLEY COUNTY.

BLUE SPRINGS ZINC COMPANY.—This company has been formed to mine on an extensive scale in Bradley County.

UTAH.

(From Our Special Correspondent.)

This is a period of transition, each week bringing new, if not unlooked-for conditions. On Monday it was announced that Bullion-Beck would probably shut down September 1st and that other Tintic mines would follow. This was a surprise, as only a few weeks before President Beck stated this mine would continue operating so long as silver remained at 50c or better. To keep their properties operating a reduction of wages from \$2.50 to \$2 a shift at the mines and a demand for a corresponding reduction in ore freight and treatment are talked of. As to wages, many miners express a willingness to work 10 hours in lieu of 8, as the law provides, if the companies will protect them from pun-

ishment. It is evident that unless there is a general reduction in cost of mining and marketing ores, many silver mines must succumb.

The announcements on Saturday last, of the advance in lead, brokers' quotation on which Western mine settlements are made from \$3.60 to \$3.85, and the reduction in giant powder of a cent a pound, were encouraging. The latter is now 15c. per pound in this market.

During the week ending August 28th there were shipped East from Salt Lake 25 cars, or 885,825 lbs., lead-silver bullion; 60 cars, or 1,189½ tons, lead-silver ore.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

VIPOND GROUP.—The nearest railroad point is Ketton on the Central Pacific, 60 miles away, and business has languished for years, but at present there are evidences of returning life through the efforts of the Salt Lake Mining and Improvement Association in working the Vipond group of eight patented and six other claims. The Lewis roller mill, the second built, has been in place about a month and is giving excellent satisfaction. The Lewis has a grinding capacity of 20 tons a day though only about 8 tons can be treated by the two amalgamating pans and one settler, which make up the mill plant. Present operations are therefore simply a practical working test on \$70 ore; a third of values in gold and the remainder in silver. It is claimed a saving of not less than 85% is accomplished. Before winter comes it is intended to add four pans and two settlers, and also to replace steam by water power, as there is a good stream with ample fall near the mill. Mining is in progress on the Sentinel, Argenta and Lexington lodes, and there is free milling ore for a 50-ton plant. President Paris, who 10 days ago was appointed manager and is in charge, states that the mill is already more than paying expenses, and that much better results will follow as soon as its capacity can be increased.

GRAND COUNTY.

(From An Occasional Correspondent.)

But little prospecting has as yet been done in this part of Utah. A few cowboys have done a little desultory prospecting, but that is all. The country rock is granite. Some good samples of silver and copper ore are reported by Colorado prospectors now in the range. The country rock east of the range is heavily stained by copper, leached from the hillsides. The most important camp is in the Miners' Basin on the northeast slope. It may be reached best from Thompson Springs, on the R. G. W. Railroad, via Moab, though even this route necessitates a stage drive of about 60 miles.

JUAB COUNTY.

GODIVA.—This mine has been closed down on account of the low price of silver.

(From Our Special Correspondent.)

For the week ending August 28th the shipments from Tintic were: Bullion-Beck, 20 cars; Centennial-Eureka, 2 cars; Gemini, 6 cars; Humbug, 4 cars; Uncle Sam, 4 cars; Mammoth, 2 cars; Swansea, 3 cars—all ore. Eureka Hill sent 10 cars and Sioux Hill 2 cars of concentrates, and Dragon Iron 13 cars of hematite for fluxing.

AJAX.—After several postponements there was a directors' meeting in Salt Lake three days ago and a committee appointed to examine the mine, etc. It is reported that operations may be resumed.

ALASKA.—An 18-in. seam carrying native copper in layers and bunches was cut August 27th, on the 158 ft. level, 15 ft. south from the shaft, which is looked upon as an important find. The metal is evidently a precipitation and is believed to indicate a good ore body, but how far away is the question. On the same level, north of shaft, is considerable carbonate and gray copper in seams through vein filling. The Alaska was thought to be a lead-silver prospect when the company began exploration last December. Uncovers the past few weeks, however, indicate that it will be a paying producer of copper, silver and gold.

BULLION-BECK.—The Bullion-Beck is liable to close down. Superintendent Kirby states that the mine never looked better and the percentage of lead in the shipping products averages 15%, which is higher than formerly, while the silver content holds up. About 80 tons a day are now forwarded to the smelting works.

MAMMOTH.—The Mammoth is a gold mine, as that metal represents 70% of the value of the ore, and the percentage is said to be increasing.

SWANSEA.—Last week the returns on a car of ore showed 134 oz. silver and 45% lead. Ordinarily the shipping mineral is 50 oz. silver, 15% lead. The shaft is down 725 ft., and below 500 ft. the ore-body is north of the shaft. Output is to be curtailed.

SOUTH SWANSEA.—The shaft is down 600 ft. with 2½ ft. of ore in the bottom. The mine looks well, though owners are in a quandary what to do. Shipping products average 45 oz. silver and 17% lead, with 37% iron. At present 24 men are employed, chiefly in development.

PIUTE COUNTY.

(From Our Special Correspondent.)

WEBSTER MINING COMPANY.—Incorporation articles were filed with the Secretary of State on August 25th; capitalization, \$200,000. The Webster vein is wide, nearly vertical contact, quartzite foot and porphyry hanging wall, with north and south

strike. The main tunnel is in 1,670 ft.; vertical distance from face of tunnel to surface, 1,300 ft. The ore is carbonate and galena, in stringers and chambers—requiring concentration. Values run about 15 to 20% lead, 20 to 35 oz. silver, \$1 to \$2.50 gold.

HORN SILVER—Manager P. T. Farnsworth says there will be no shut down under present conditions. The product is largely lead and copper.

SAN JUAN COUNTY.

(From an Occasional Correspondent.)

No mining on a large scale is being done here this season. Work is suspended pending the sale of the two properties showing the greatest development. The ore is principally copper pyrites carrying gold in contact veins, between walls of porphyry, and quartzite. About 25 men are working in the district and some fair returns are resulting from their labor. The 5-stamp mill on the Golden Dream is dropping about one-half time on soft surface ore. The ore of this region is partly free milling and partly concentrating. This camp is about 85 miles south of Thompson Springs and has daily mail stage from the R. G. W. Railroad station.

TOOELE COUNTY.

BRICKYARD—Captain De Lamar has purchased the remaining interests in this group of mines which adjoin the Golden Gate on the west. The price paid was \$250,000.

(From Our Special Correspondent.)

CHLORIDE POINT—On August 28th ground was broken for a 10-ton cyaniding plant, to be erected as speedily as may be. Formerly this was considered solely a high grade silver property, but in sinking it has been found the lower the ore in silver the higher in gold. There is a large supply of mineral averaging \$6, or better, gold, with 7 to 15 oz. silver, and the mill is to treat this rock. The main tunnel is in 970 ft., and connection was made last week with 150-ft. shaft, ventilating the workings, which was sorely needed. The vein is a contact, akin to the Northern Light, with the addition of the high-grade silver ore, of which a carload is shipped each week.

LA CIGALE—Chiefly owing to delay in receiving the pipe for the pipe line from Obhir Creek the mill will not be ready for its initial run for several weeks. Meanwhile experimental cyaniding tests are in progress by George A. Packard, the metallurgic chemist who is to have charge of this all important function. The mill is to start on October 1st—the most modern improved plant in the Mercur region. Sinking is in progress on Discovery and Boston inclines and Mercur shaft, each 500 ft. apart; the two first are 360 and the latter 120 ft. deep. Mercur shaft struck ore zone at 96 ft. and beyond that point follows the dip. It is calculated that there are 200,000 tons of ore exposed and samples just taken from all faces give an average value of \$6.20 gold. John F. Armstrong, formerly with the Minnesota Iron Company, last week assumed charge of underground work. The caving system of mining is to be adopted.

LITTLE PITTSBURG—Developments continues in progress in the silver vein, with encouraging results. The tunnel is in 175 ft.

MERCUR—Exploration in Lu'u territory has opened the upper vein by tunnel 75 ft., all in ore. The nearest working to this new development is distant 400 ft., in mattie ground. The mill is treating 280 tons a day. A few days ago a shipment of 10 flasks of mercury was made, obtained from heating cyanides. Some two or three flasks are thus collected each month. Mercur cyanides as marketed carry 1,500 to 2,000 oz. gold to the ton.

NORTHERN LIGHT—Wednesday of this week all tanks were in place and the mill is complete as planned. There are six 30-ton, four 45-ton, 18 60-ton all steel tanks, bottom and side the first in the district. A Blake crusher and two sets of rolls reduces the ore to 1/2 in. mesh. Owing to silver being present leaching requires 10 to 12 days. Values are about evenly divided between gold and silver ore carrying \$5 to \$12 per ton. The vein is a contact, 6 to 12 ft. or more thick, with a lime roof and floor; main tunnel, 640 ft., which, with drifts, show large reserves of oxidized ore.

SUNSHINE—The officials deny that the mill is to resume work soon.

VERMONT.

WASHINGTON COUNTY.

BARRE GRANITE QUARRIES—It is reported that a syndicate has secured control of these quarries, and will begin operating them under one management September 15th.

WASHINGTON.

FLATHEAD COUNTY.

SILVER CABLE—A concentrator is being put in at this mine. The vein uncovered varies in width from 4 to 20 ft., and assays are said to run from \$5 up. The ore is pyritic, carrying gold, silver and some lead.

KITTITAS COUNTY.

CONGER MINING COMPANY—This company has sold its property to persons in Tacoma for \$40,000. The new owners contemplate the erection of a mill.

OKANOGAN COUNTY.

(From Our Special Correspondent.)

Deposits of gold mica have been found in the Che-

lan Falls District at a distance of one-half to three-quarters of a mile from the Columbia River, and about 1 1/2 miles from the town of Chelan Falls. The ledge containing the mineral can be traced for over 3,000 ft. The quality of the mica is good, but so far as has been investigated the kidneys in which it occurs are small, and for the most part yield sheets which will not cut over 2 1/2 x 3 in. The prospectors who located the deposits took out about 700 lbs. of the mineral.

STEVENS COUNTY.

BIG IRON—Further development work is contemplated on this property, and it is reported that \$300,000 will be spent in this direction.

WISCONSIN.

There is said to be a panic among those Milwaukee coal dealers that have large contracts on hand, owing to the failure of the mine operators and miners to come to terms at the recent Pittsburgh conference. Few coal men in the city are thought to have stocks sufficient to last beyond September 15th. Counting in the coal afloat there may be enough in sight to tide things over until October 1st, but hardly sufficient to serve beyond that date. These conditions are said to obtain over a great part of the Lake territory.

FOREIGN MINING NEWS.

AUSTRALASIA.

QUEENSLAND.

The production of gold in this Colony in June amounted to 61,829 oz., of which 59,697 oz. was from quartz and 2,132 oz. from alluvial gravel. Of the total production the Charters Towers District furnished 27,400 oz., and Mount Morgan 12,907 oz. The total yield for the six months ending June 30th, 1897, was 361,225 oz., which was an increase of 62,233 oz. over the corresponding period in 1896. On the subject of the returns for the month last past, Messrs. Allan, Bright & Company report: The figures for June are highly satisfactory. The June dividends make a record for the last three years, and the half year's total dividends show a surplus of nearly £100,000 over calls. The half-year's yield, too, is highly satisfactory, the total returns being 45,600 oz. in excess of the corresponding period of last year, and the mill returns alone are about 11,000 oz. in excess of the mill, chlorination and cyanide returns for the first six months of 1896. The June yield was 16,106 tons for 18,749 oz. from the mills, 576 tons for 796 oz. from chlorination, and 18,238 tons for 7,810 oz. from cyanide, a total of 34,920 tons for 27,355 oz. The dividends for June were £42,525, and the total for the six months, £139,312. The calls for June were £5,171, and for the six months, £43,013, so that the dividends on the half-year show a surplus of nearly £100,000, or say £16,000 a month—a statistical position which few gold-fields can boast. It will be noticed that Messrs. Bright & Company set the excess for the last half 17,233 oz. below the official return.

TASMANIA.

MOUNT LYELL COMPANY—Some idea of the proportions of the company may be formed when it is considered that it holds under lease about 750 acres of land, about 350 of which cover the mining properties and 400 of which include the area where the reduction works are located and the reserves from which are obtained the fluxes and fuel for the smelters and concentrators. The capital of the company is £900,000, in 300,000 shares of £3 each, of which number 220,913 shares have been issued, fully paid up to £3 each. The head office of the company is at Melbourne, but there is a local directorate in London, England, where a large number of shares are held. The metallurgist is Robert Sticht, the engineer in charge of mine Lindesay C. Clark, and the superintending engineer of railways E. Carns Driffield. The development of the company's enterprise has taken two years. In the works and on the railway the company employs about 1,500 men, which number will be more than doubled soon. Mr. E. Carns Driffield is an American. A railway 17 1/2 miles in length through a most difficult country from Teep kana to Queenstown is part of the work accomplished during the last two years. By next summer the company expects to smelt 1,000 long tons of ore each day.

WESTERN AUSTRALIA.

The production of gold in June was 53,348 oz., of which by far the greater part came from the Coolgardie District.

CANADA.

BRITISH COLUMBIA.

It is reported that the smelting works in contemplation at Vancouver are about to assume concrete form. Capital to the amount of \$250,000, so the report goes, has been subscribed. The capacity is to be 350 tons a day. A refinery is also to be built.

BRITISH COLUMBIA—CARIBOO.

HORSEFLY HYDRAULIC MINING COMPANY—After several years' preparation this company has become a producer on a big scale. The clean-up will, it is thought, be not less than \$60,000, perhaps half as much again. The actual working expenses are about \$40 a day. The hydraulic elevators are a great success. The deepest pit now worked is 35 ft. The cement mill is running continuously and the cement has been found to carry from \$4 to \$6 a ton.

BRITISH COLUMBIA—CASSIAR.

It is expected there will be a large exodus to the Klondike from this region next spring. The Teslul Lake region seems to be promising, and that indicates that the northern prolongation of the Cassiar range will probably continue auriferous.

BRITISH COLUMBIA—LILLOOET.

GOLDEN CACHE—It is reported the stamp mill will begin operations before the end of this month. The Alpha Bell Company, which owns the extension of the Golden Cache ledge, also proposes to erect a mill this fall, while 10 stamp mills are contemplated by the owners of the British Columbia and Excelsior mines.

BRITISH COLUMBIA—NELSON.

PAYNE—The ore shoot in this mine is at least 756 ft. long as a tunnel of that length has been driven and is in ore all the way.

(From Our Special Correspondent.)

HALL MINE—This company has declared no dividends as yet, but it is reported one will be declared before the end of the year. The smeltery connected with this mine is making daily shipments of copper matte to the reduction works in Kansas City.

WAR EAGLE—This company has been making small shipments of ore to the Hall Mine smeltery.

BRITISH COLUMBIA—SLOCAN.

The exports of ore from the Slocan Range during the week ending August 21st were the heaviest for several months, as is shown in the following table:

	Tons.	Approximate value.
Payne mine, Slocan.....	350	
Kootenay Ore Company, Kaslo.....	315	
Slocan Star, Sandon.....	60	
Washington.....	32	
Noble Five mines, Slocan.....	113	
Whitewater mine, Slocan.....	76	
Surprise mine, Slocan.....	17	
Rambler mine, Slocan.....	15	
Black Diamond mine, Ainsworth.....	77	
Total for week.....	1,253	\$138,660
Total so far for August.....	3,505	401,137
Total for July.....	4,139	543,852
Total for June.....	3,464	483,885
Total for May.....	2,995	397,797
Total for April.....	3,764	433,234
Total for March.....	5,822	677,681
Total for February.....	5,211	562,863
Total for January.....	4,543	675,506
Total via Revelstoke to Aug. 15th.....	15	512,678
Total so far for 1897.....	34,008	4,688,603

Although the fall in the price of silver has caused a few dry silver mines to close, that is mines that produce no lead, it does not seem likely that it will necessitate the shutting down of any large number of Slocan mines. West Kootenay silver lead ores are very high grade and can probably be mined at a profit as long as any Western mines. Mr. J. B. McArthur, of Vancouver, B. C., has recently shown that owing to decreased charges for treatment, improved facilities for handling ores, and an increased value of lead, the net profit of mining in the Slocan is about the same as it was a year ago.

The sudden drop in the price of silver has led to rumors about this and that mine closing down, but it has all ended in talk. Mine owners here fully recognize that given reasonable shipping and smelting facilities they can mine at a profit even with silver at the half-dollar mark. The main difficulty is in the newer regions which are badly in want of a little initial capital to put them on their legs, and these naturally suffer by the determination of investors to go where the vagaries of the market value of their product will not affect them. Fortunately the regions, which comprise the Slocan Lake District are not entirely dependent on their silver values since there is gold in sufficient quantity to make its extraction a source of considerable income to the district.

BRITISH COLUMBIA—WEST KOOTENAY.

S. C. Chisholm is said to have opened a large vein of rich galena ore on Fish Creek, which empties into Upper Arrow Lake.

LA REGINA—This company, recently incorporated under the laws of British Columbia, owns property situated nearly midway between Trail and Rossland. The ore consists of pyrrhotite with pyrite, and can be traced along the entire length of the claim. The development work consists of a shaft 45 ft. deep and another 32 ft. deep, also a 40-ft. crosscut with an average depth of 8 ft.

LE ROI—The power pump connected with the Le Roi compressor, which has been placed on the dam at the head of Trail Creek, began work on the night of August 23d. The water pipe has a diameter of 4 in.; the air pipe is 1 1/2 in.

BRITISH COLUMBIA SMELTING COMPANY—This company produced a 250-oz. brick of fine gold last week. This is the first refined gold turned out in British Columbia.

SUNSET—A seven-drill air compressor and a new hoisting engine have been ordered for this mine.

SUNSET NO 2—The shaft is down 40 ft. on the South vein, and a crosscut run to the hanging wall shows 8 ft. of ore. It resembles the ore from the War Eagle, carrying iron and copper in proportions that make a good smelting ore. It runs about \$30 in all values. The shaft will be sunk on the vein to the 100-ft. level, when drifting will begin. A machine drill is to be placed in the shaft. There is a

higher percentage of copper in the South vein, but the ore body is much smaller. The Sunset has for neighbors on Red Mountain the Le Roi, War Eagle, Center Star and Josie.

(From Our Special Correspondent.)

COLUMBIA & KOOTENAY.—Forty men that were recently hired to put in development have been discharged, as the work is completed.

NOVA SCOTIA—MONTAGUE.

SYMON KAYE.—A distinguished party was present by invitation at the last clean-up of this mine on August 23th. The result of three weeks' work was a brick of \$5,000. A rich vein of gold-bearing quartz has been struck. The Halifax Recorder was informed by John C. Oland, who is working the mine, that gold to the value of \$2,000 was taken out in one day.

NOVA SCOTIA—PICTOU COUNTY.

TONGUOY.—This mine is turning out very rich quartz. Within a week from \$3,000 to \$10,000 worth of gold has been taken out. One shot recently dislodged quartz said to contain 200 oz. of gold.

ONTARIO—LAKE OF THE WOODS.

(From Our Special Correspondent.)

FOLEY MINE.—This property, situated near the Ferguson mine, was first worked in 1895. It is owned by the Foley Mines Company, of Detroit, Mr. Rod. A. Demme, of Detroit, being the president. There are three shafts on the property; No. 5 down 100 ft. with a crosscut of 70 ft. on that level; the Lucky Joe down 75 ft.; and the North Shaft down 250 ft. The vein on which the North shaft is sunk was only about 25 in. wide at the surface, but at the 200-ft. level a 200-ft. drift has been made on the vein which at that point is found to be from 5 to 8 ft. wide. The development of the mine has been done chiefly with three air drills, but as they are unable to keep the 20-stamp mill, which has been erected on the property, running, a new 12-drill compressor plant is being installed. A quarter of a million dollars has been spent in developing the property, and \$30,000 worth of bullion has been taken from it.

MIKADO.—The fall clean-up will soon be made, and it is expected the returns will equal those of last year, viz., \$70,000. The amalgam is gathering very thickly on the plates.

OLWE MINE.—This property is nine miles north of Mine Center. A number of veins are being developed, but the principal work is being done on a 28-in. vein that was first discovered. There are two shafts on the property 75 ft. and 65 ft., about 400 ft. apart. An Alaska mill with two 1,000 lb. stamps and one 6½-ft. Frue vanner has been erected on the property. There are also steam hoists, pumps, etc., and a saw mill which has manufactured all the lumber for the stamp mill and buildings. There is 1,000 ft. of gravity tramway connecting the mine and shafts. The capital stock of the company is \$50,000.

REGINA.—Work is being pushed under the management of Mr. Pringle. The shaft is down about 250 ft., and the vein is improving in width and value.

SULTANA.—The Sultana mine continues to make its weekly output of bullion, which ranges from \$1,000 to \$2,000. The main shaft is now down between 400 and 500 ft., and the 10-stamp mill on the property is unable to crush the ore mined. Alterations are being made in the plant, and the stamps now in use are to be removed and 20 new stamps erected. The management is also purchasing a new Gates crusher and an air compressor plant. The Sultana is the pioneer of the district and has been running successfully for the last four years. An offer of \$2,000,000 is said to have been refused by the owner, Mr. Caldwell.

MEXICO.

DURANGO.

The sale and transfer of the San Gonzalo mining and milling properties in the District of Panuco de Coronado, State of Durango, has just been concluded. This property consists of the well-developed San Gonzalo mine, situated near the town of Avino, a Fraser & Coalmers 10-stamp mill and luviation plant, and a large dwelling and store building in Avino. All are within eight miles of the San Gabriel station of the Mexican International Railway and 25 miles from the city of Durango. The purchasers are Messrs. Andy Evans, John W. Sharpe and William H. Mealy, of Mexico, and William Weir McKee, of Pennsylvania. These gentlemen secured the property for \$195,000. The new owners have already shipped pumping machinery from Monterey and ordered a steam hoist with a view to sinking as rapidly as possible. The capacity of the mill will also be increased to 75 tons per day. There are now on the dump about 3,000 tons of ore which can be profitably milled. The purchasers have incorporated as the San Gonzalo Mining and Milling Company, with William H. Mealy as president and John W. Sharpe as general manager. The new company has also acquired the Enrique property, which adjoins the south side of the great Avino vein, and the Santa Rosa and Sonoma properties which are an extension of the Avino vein on the east. The Santa Rosa is now being opened up and all of the mines will be as soon as the capacity of the mill can be increased sufficiently to handle the ore.

GUADALUPE Y ANEXAS.—These quicksilver mines, situated in the mountains about 20 leagues west

from the city of Durango, are reported to be opening up well. The cinnabar ore is abundant, and some of it is said to yield as high as 6% quicksilver, while the average runs from 10 to 15%. The mines are owned by citizens of Mexico, who have formed a company organized under Mexican law. The manager is Antonio Maza.

(From An Occasional Correspondent.)

The Copalquin and Lemon mining camp is situated in the northwestern part of this State, west of the Continental Divide. In this camp are located four mines of much value, El Refugio, Dulces Nombres, San Manuel and La Soledad. The first three have been worked for years by the natives, and operated in their crude way have produced upward of \$1,000,000 in gold and silver; the last mine is of more recent development, having been opened during the last four years and worked on a systematic plan, and in this mine there is a great quantity of good paying ore in sight. The camp also contains a large number of lodes of gold and silver bearing ores which have only been superficially prospected, but which give ample evidence of their large extent and high-grade character. Prior to 1895, when the Mexican government sent a party of its Geological Commission to investigate the northern portion of the State of Durango with regard to its geological and mineralogical formations, little was known of the mineral resources of this section outside of the bonanza mines mentioned above. The researches of this commission gave the first intelligence of the extraordinary extent and value of the mineral deposits of the Copalquin and Lemon mining districts. The Consolidated Copalquin Mines Company, with main offices in Chicago, has just been incorporated with a capital of \$1,000,000, under the law of the State of New Jersey, to operate in Copalquin & Lemon. Its properties so far acquired are the mines El Refugio, Dulces Nombres, San Manuel, La Lina, Cruz Verde, La Luce and Socorro. The entire camp is a high-grade gold and silver proposition. Considerable quantities of ore have been taken out which carry from \$500 to \$1,000 per ton in gold and silver.

HIDALGO.

It is estimated that last year the output of silver from the Pachuca mines was fully \$5,000,000, of which \$6,000,000 was treated in the vicinity and the rest in the form of ores was shipped to the United States and Europe.

LOWER CALIFORNIA.

Two seams of manganese ore, each 3 ft. wide and traceable for over a mile are said to have been discovered. Specimen assays show 57% manganese.

MICHOACAN.

RIO TINTO.—Some time ago it was announced that these copper mines, in this State, had been sold. The purchasers comprise many of those who were the original purchasers of the Bolson mines, including the Rothschilds of Paris. It is said to be the intention of the new company to build a railroad from the mines to the Pacific and to work the mines on a large scale.

SONORA.

William Shuckman has put a dredging boat for gold mining on the Yaqui River at San Antonio de la Huerta.

Rich strikes of gold are reported in the Yaqui country between the Yaqui and the Mava rivers. It is only since the pacification of the Yaqui Indians that prospectors have been able to enter this district.

NACASORI.—These mines are now being operated by the Copper Queen Company of Bisbee, Ariz.

SOUTH AFRICA.

SOUTH AFRICAN REPUBLIC.

The output from the Rand gold mines for June was 251,529 oz.; for July, 243,479 oz. The decrease, 9,050 oz., was due to poorer ore.

In the account of the Jubilee celebration, Machinery (of Johannesburg) of July 1st said: "In the matter of design the Consolidated Gold Fields Company Buildings undoubtedly won the highest encomiums, and Mr. George R. Mair, electrician of the Consolidated Gold Fields Company, who took the task in hand, must be heartily congratulated on his success. The idea was very appropriate, consisting of two large wooden flags, the Union Jack and Vierkleur, crossed in token of friendship, and closely studded with colored lamps representing the two nations' colors. Between the two flags was an illuminated portrait of Her Majesty, and high above these an illuminated prism was made to spin round incessantly, driven by an independent motor. To transform the stiffness of the flags into the natural softness of real fluttering ensigns, a rippling motion was ingeniously sent through the wires, giving the flags a beautiful undulating movement which completely changed their appearance from an ocular point of view. To create the remarkable effect obtained, the lamps were so connected with coils of resistance that the potential in certain lines was cut down below the normal voltage required for the candle power of the lamps, and the position of the lines of lamps burning at full voltage was changed by means of a controller cutting out the resistance coils one after another in rapid succession. Three hundred and fourteen red, white and blue lamps were used for the Union Jack, 240 red, white, blue and green for the Vierkleur, and 850 lamps altogether."

COAL TRADE REVIEW.

NEW YORK, Friday Evening, September 3.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending August 28th, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	71,283	2,156,988	2,376,532

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending August 28th, and for years from January 1st, 1897 and 1896:

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	40,060	1,576,871	1,519,452
Barclay, Pa.....	1,123	28,808	27,581
Beech Creek, Pa.....	"	2,427,814	1,975,400
Broad Top, Pa.....	"	282,633	"
Clearfield, Pa.....	75,913	2,981,746	3,106,636
Cumberland, Md.....	"	2,459,979	2,337,186
Kanawha, W. Va.....	189,339	3,053,465	2,058,541
Phila. & Erie.....	4,918	175,259	50,726
Pocahontas Flat Top.....	"	"	2,297,229
Totals.....	210,453	12,948,575	13,246,063

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	4,783	751,633	684,640
Pittsburg, Pa.....	38,746	1,238,096	1,283,191
Westmoreland, Pa.....	71,773	1,462,711	1,275,191
Totals.....	114,602	3,452,470	3,243,022

Grand totals..... 325,055 16,401,045 16,489,085

Production of coke on line of Pennsylvania Railroad for the week ending August 28th, 1897, and year from January 1st, 1897, in tons of 4,000 lbs.: Week, 92,777 tons; year, 2,924,301; to corresponding date in 1896, 2,846,521 tons.

1 For week ending August 21st. * Returns not received.

Anthracite.

The market during the past week has been quiet, many of the dealers having bought pretty heavily prior to the last advance, most of the coal going forward being upon old orders. Dealers do not seem quite prepared to buy at present prices, so that a period of semi-stagnation has come upon the trade. There are unfortunate possibilities of future trouble in the Lehigh region, and no one seems to know how far-reaching they may be. There is a large and undesirable foreign element in that region, and operators feel uneasy as to the outcome of the present discontent, which while not very pronounced as yet causes apprehension.

There is a fair demand in the West, and present indications are that business will continue upon these lines for some little time, though there is likely to be considerable disappointment in certain quarters as to its volume.

The extra demand for small sizes that was anticipated owing to the trouble in the bituminous mines has not made itself felt to any marked degree, the slight additional demand being offset by an increased production.

Prices of anthracite coal remain as follows: Broken, \$4; egg and chestnut, \$4.25; stove, \$4.50 per ton alongside New York.

Bituminous.

The Eastern seaboard soft-coal market is quiet, though there is considerable coal moving upon contracts. It is thought, however, that these shipments are depleting the stock of orders in hand. There is a little transient trade, though the total does not amount to very much, but it is looked upon as almost a gift, not having been expected.

Trade east of Cape Cod is receiving more coal than the orders coming from that territory can take the place of, and it is reported that the few cargoes that have been sent to that market have been difficult to handle. The producers are beginning to make efforts to clean up the contracts that they hold for this Eastern territory, at least as far as shoal water ports are concerned, though it would seem as though it would be some little time before ice could prevent del veries on such contracts. It is not believed that there are any large balances left to be shipped on this class of contracts.

The trade between New York Harbor and Cape Cod is fair. There is, however, no pressure for coal from this territory, consumers and middlemen merely taking coal to fill up holes in their stocks on hand or for daily consumption.

New York Harbor trade is comparatively active, a little more coal than usual being forwarded to this territory.

All-rail trade is slightly reduced in its proportions from what it is considered the usual demand calls for.

Transportation from mines to tide is improved, and from all accounts the producers are not at all sorry, as they are pressed to get vessels that have been secured, loaded.

Car supply, in some instances where shippers have not taken care of their coal properly on arrival, or where they have not a call upon cars either by ownership or otherwise, has been short, but in the great majority of cases shippers have been able to control enough empty cars to satisfy their wants.

The coastwise vessel market is fairly well supplied with craft, and the adequate supply of bottoms has permitted producers to ship more freely, in some instances relieving the situation of the old orders that

have hung fire for one reason or another. Freight rates, however, have maintained themselves, and current quotations have been secured without difficulty by the vessels.

We quote freights from Philadelphia as follows: To Boston, Salem, Wareham, Bath and Bangor, 70 @75c.; Portland, 70c.; Providence, New Bedford and Sound ports, 60c.; Lynn, 75@85c.; Portsmouth, 75@85c.; Newburyport, 80@85c.; Dover, 90c. and towages; Saco, 85c. and towage; Gardner, 70c. and towages. From 5c. to 10c. must be added to these rates for further lower ports.

NOTES OF THE WEEK.

The Lehigh Valley Coal Company reports for July gross earnings, \$1,455,761; an increase of \$118,911, as compared with the same month of 1896, and net \$29,060, a decrease of \$23,901. For the eight months ending July 31st, the gross earnings were \$9,293,599, a decrease of \$493,625, as compared with the corresponding period of last year and net loss \$262,376, a decrease of \$299,602.

The Schuylkill Coal Exchange gives notice that the Philadelphia & Reading collieries, drawn to return prices of the coal sold in August, 1897, to determine the rate of wages to be paid, show an average price of \$2.67, and the rate of wages to be paid for the last half of August and the first half of September is 6 per cent. above the \$2.50 basis.

The Reading Coal and Iron Company reports gross earnings for July of \$2,075,758, an increase of \$47,533 over the same month last year, and net \$161,444, an increase of \$93,669. For the eight months ending July 31st, the gross earnings were \$12,912,107, a decrease of \$1,708,449, as compared with the corresponding period in 1896, and net \$487,397, an increase of \$49,310.

The Tennessee Coal, Iron and Railroad Company will ship 500 tons of its Alabama coal to Vera Cruz, Mexico, from Pensacola, Fla. The charges on Mexican vessels taking on coal at American ports have been eliminated by the recent Congress, as Mexico had agreed on the same lines to reciprocate. This puts American coal on the same basis as the English product, which heretofore had the advantage, because Mexico loaded it in England free. It is expected that hereafter our coal trade with Mexico will grow a good deal.

Buffalo.

Sept. 2.

(From Our Special Correspondent.)

The anthracite coal trade is quiet, no change made in quotations yesterday and none expected this month. Stocks light for shipping West, but plenty for home trade and near-by points.

The bituminous trade is joggling along, dealers supplying customers only in small quantities at a time, pending a settlement of the strike, at quotations which are nominal as far as the general public knows. Supply here and in sight is sufficient to last several days. Soft coal for fuel purposes is nearly exhausted, since the daily arrivals are not in excess of the demand. Lake freights continue very low; shipments of coal westward are meagre. As an example, out of about 50 vessels leaving port last Tuesday only two secured cargoes of coal. Down freights on grain and ore have advanced. Fuel coal for vessels is selling at about \$2.50 per net ton, delivered on vessel.

The shipments of coal westward by lake from this port for the week ending August 23rd, inclusive, aggregated 53,050 net tons, distributed as follows: 14,600 tons to Chicago, 10,200 tons to Milwaukee, 10,500 tons to Duluth, 3,350 tons to Toledo, 1,600 tons to Marquette, 500 tons to Killy Island, 1,700 tons to Manitowoc, and 600 tons to Port Huron. The rates of freight were 20c. to Chicago, Milwaukee, Duluth and Superior; 25c. to St. Ignace; 45c. to Killy Island; 25c. to Toledo and Port Huron, and 20c. to Marquette and Manitowoc; closing dull, with vessel-men hoping for better prices for freight and larger movement of coal.

Our city water-works commissioners have used steam pumps for their engines up to the present time. Last week a bid was tendered for an electric pump, to be driven by Niagara power, at a cost of \$59,400 for the pump and \$30 per horse-power per annum for the electricity. The principal bid for a steam pump was \$64,250, to be run at a cost of \$60 per horse-power.

It is understood that the Secretary of the Navy has ordered an investigation as to the profitable use of petroleum for fuel purposes for the navy.

The coal shipments by lake from Buffalo in August were 281,983 net tons as compared with 346,286 net tons in 1896 and 307,192 net tons in 1895. For the season to September 1st, in 1897, 951,571 net tons, as compared with 1,240,184 net tons in 1896 and 1,133,024 net tons in 1895.

Chicago.

Sept. 1st.

(From Our Special Correspondent.)

Anthracite Coal has improved a trifle in sales during the week, orders having come in a little more freely from dealers out of town. Orders that are coming in are as a rule for but small quantities, and show that the average dealer is feeling his way before making any active campaign. So far this season the demand for hard coal has been exceedingly light, but it is anticipated that the remaining portion of the present year will see a vast improvement, and a deal of coal will be placed before the year is out.

Industrial conditions are greatly improved, and prospects are decidedly brighter for improvement than they have been for a number of years, so it is expected that coal will soon take on considerable activity. Prices in both wholesale and retail coal are far below the quoted circular prices, indicating that trade is in the depths. Circular prices on grate coal is \$5.35, and egg, stove and chestnut \$5.65.

Bituminous Coal.—There has been a fair business transacted in soft coal, due to buying on the part of manufacturing enterprises. Sales are not large but are more numerous, and bespeak a better trade. There is considerable coal coming to town now from the mines in Illinois and Indiana that have renewed operations. Prices are only moderately good, though there is more interest displayed in holding them up.

Cleveland.

Sept. 1.

(From Our Special Correspondent.)

Coal.—The probability of an early settlement of the strike has had the effect of easing the market in this city. For a time it looked as though the operators and dealers would be compelled to make another slight advance, but since there is talk of arbitrating the differences between the operators and the miners the price has slumped. The arbitration proposition made by T. E. Young, of M. A. Hanna & Company, has given the manufacturers of the city confidence, and some of them who were seriously considering the advisability of closing down until after the strike for fear they would be compelled to pay still more for coal, have announced that they will continue to operate their establishments.

Pittsburg.

Sept. 2.

(From Our Special Correspondent.)

Coal.—There is little change in the situation, the demand continues moderate and prices have undergone little change. Meetings are being held without any practical result; the opinion prevails that the strike will soon be over. Prices of coal are nominal. Cincinnati coal market offerings are light; most of the coal at the landing is held by retailers; prices, 5 1/4 @ 6c. afloat; at retail, Pittsburg, \$2.25 delivered.

All the coal under S. Williams' farm, in Fernard Township, 121 acres, has been sold. The company will be known as Irwin Basin Coal Company; the price paid was \$140 per acre.

Beaver and New Castle capitalists have formed a stock company; great mines on the Beaver are to be opened, several hundred acres of coal lands having been purchased and leased. By September 15th they will have the mines in working condition.

Connellsville Coke.—The shipments from this region amounted to 6,730 cars as against 7,045 cars the previous week, a decrease of 315 cars. Pittsburg shipments held up well, making an increase of 30 cars. The worst slump was from the East, amounting to 176 cars. The Western trade fell off 160 cars. The car supply is fairly good and there is nothing to stand in the way of a much larger trade.

Work has begun here on a new coke plant for the Riverside Iron Company, at Benwood, West Va., which will not only furnish that company with coke, but will give a supply of gas sufficient for use of the heating furnaces.

The Isabella Coke Works at Cokeville have started up in full, after a long spell of running on half time.

Summary of the region was 11,921 ovens in blast with 6,781 idle. There were no ovens fired up; production for the week, 122,062 tons, against 121,583 tons the week previous. In the running order 5,151 ovens made six days; 6,367 ovens five days; 363 ovens four days, and 50 ovens, Semet-Solvay, made seven days. Shipments from the region: To Pittsburg, 3,085 cars; sent West, 2,550 cars; to points East, 1,095 cars; total, 6,730 cars.

IRON MARKET REVIEW.

New York, Friday Evening, Sept. 3, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	Sept. 4, 1896.	Sept. 3, 1897.	Jan., '96.	Jan., '97	Jan., '96.	Jan., '97
Anthracite.	35	21,430	21	12,125	897,940	531,462
Coke.....	112	133,110	111	150,475	5,511,714	4,537,257
Charcoal....	23	6,760	20	4,153	199,725	145,507
Totals....	170	161,300	152	166,750	6,609,379	5,237,226

The situation in the iron market continues encouraging and there is no doubt that the more prosperous times which appear to be approaching are reflected in the iron trade. Especially good reports come from Pittsburg, the greatest center of this business, where prices have already advanced materially. Sales of pig iron have been effected on deliveries extending to March, 1898, and manufacturers are unwilling to book orders for long delivery, except at advanced prices. The market for finished iron and steel products shows similar firmness. Philadelphia reports show strength in the market there, but no such important advance in prices as is noted in Pittsburg, although this is looked for speedily. A great deal of business in pig iron has been done in Philadelphia during the past week.

The Chicago market is active and sales have been made there at advanced prices.

NOTES OF THE WEEK.

The new steel plant at Wheeling, W. Va., will soon be completed.

The Carnegie Steel Company recently received a contract for steel rails and fastenings from the Tennessee Central Railroad, which is said to amount to \$416,000.

The Crane Iron Company has imported at Philadelphia a cargo of Inxataca specular iron ore, which was mined near the Orinoco River in Venezuela. It is said that this is the first cargo of its kind shipped to this country.

The imports of American pig iron and unwrought steel into the United Kingdom during the seven months of this year are reported by the Board of Trade as follows:

	Pig iron		Unwrought steel	
	Tons.	Value.	Tons.	Value.
January.....	9,022	\$21,152	3,193	\$15,976
February.....	7,733	18,099	6,868	32,723
March.....	3,701	10,555	2,032	9,906
April.....	8,060	18,076	5,302	23,851
May.....	7,074	15,479	5,821	16,840
June.....	9,057	19,745	2,669	12,070
July.....	3,251	6,755	1,186	5,641
Total 7 months.	47,848	\$109,861	24,011	\$116,957

Bids for furnishing heavy projectiles for the Ordnance Department of the army were opened at Washington on September 2d. The bidders were the Driggs-Seabury Gun and Ammunition Company, of New York; the Midvale Steel Company, Philadelphia; the Firth Sterling Steel Company, and the Carpenter Steel Company, both of New York. On all five items on which bids were asked the Driggs-Seabury Company was the lowest bidder. It agreed to furnish 195 8-in. shot at \$69.80 each; 605 10-in. shot at \$114.50 each; 150 12-in. shot at \$212 each; 270 12-in. mortar shells of 800 lbs. weight at \$114 each, and 50 12-in. mortar shells of 1,000 lbs. weight at \$195 each.

New York.

Sept. 3.

The opening week of September shows a more hopeful feeling in the local iron market; the demand is broadening and prices in some lines are advancing. An encouraging feature of the market is that but little iron and steel is being sold for speculative purposes, excepting Southern pig iron, which is traded in more or less frequently by warrants on the New York Metal Exchange. Contract work is still rather scarce in the East; the large consumers are holding off until later in the season.

Export business continues moderate in consequence of the high ocean freights and the scarcity of vessels. Among the shipments this week we note a quantity of mining machinery, valued at \$2,260, for Iquique, Chile, and \$7,870 worth for Cape Town, South Africa; 150 tons of pig iron for Yokohama, Japan; 4 tons for Hull, England, and 618 tons for Rotterdam, and 160 casks of ferro-manganese for Antwerp. On September 1st there was shipped to Odessa, on the Black Sea, \$1,644 worth of electrical machinery. On the day previous 255 tons of old steel rails and 262 tons of old iron rails were sent to Genoa, Italy.

An interesting shipment this week is that made by the Pratt & Whitney Company, of Hartford, Conn., of 100 tons of gun-making machinery for Japan. This is the second shipment of its kind, and we understand the tools sent will be used in making muskets for the Japanese army. The present shipment includes 35 gun-boring machines and 20 for rifling, besides numerous small tools. The Pratt & Whitney Company has an agent traveling through Japan and China in quest of such orders.

A few days ago the Lackawanna Iron and Steel Company received an order for 2,000 tons of steel rails for early shipment to Australia. Among the orders taken for Japan were boiler plates, rivets and electrical machinery.

Our Mexican and South American trade has abated somewhat, and the purchases of finished iron and steel that were made this week are principally to fill immediate wants. The orders taken for Mexico include track material, mining machinery, contractors' supplies and iron pipe, while for the South American States they consist of nails, iron pipe and hardware principally. It is reported that the Dickson Locomotive Works have received an order to build two narrow-gauge engines for San Domingo and one for Russia. A representative of the Knoch, Limited, one of the largest bicycle factories in Manchester England, is now visiting America for the purpose, it is said, of purchasing cold drawn steel and machinery.

Iron-bar and hoop manufacturers in this country contemplate the establishment of selling agencies in London for the purpose of building up a regular export business in Europe.

Pig Iron.—The present situation is promising, and from some quarters come the reports that consumers are buying in a better way than for several weeks past. Sales agents who have received orders this week state that prices have been fairly well maintained. Some, however, continue to complain of shading in quotations and of a small demand from their customers.

There is no doubt that some brands of Northern

iron have been selling at 50c. below the market. Prices are, however, stiffening somewhat in consequence of the advances in the Southern product. The Tennessee Coal, Iron and Railroad Company has put up its price on No. 2 foundry to \$7 per ton at Birmingham, and is quoting \$7.25 per ton for small quantities. Other grades of pig iron from this company's furnaces have been advanced in proportion.

Within the last week there has been rather active speculation in Southern pig-iron warrants, and sales aggregating several thousand tons are reported to have been made by Wall street people. These persons have made very moderate offers to people in the trade, but as yet no large transactions can be reported. Warrants were sold on the Metal Exchange at \$6.50@6.75. The freight rates from Niagara to tidewater were advanced this week from the basis of 80c. to 85c., to \$1.25 to \$1.40. Quotations are: Northern No. 1 X Foundry, \$11.50@12 per ton; No. 2 X foundry, \$10.25@11; No. 2 plain, \$10@10.50; gray forge, \$9.75@10; Southern No. 1 foundry, \$10.50@10.75 per ton; No. 2, \$10@10.25; No. 1 soft, \$10.50@10.75; No. 2 soft, \$10.25@10.50; gray forge, \$9.50@9.75; Basic, \$10.50@10.75. All prices are for tidewater delivery.

Cast-iron Pipe.—Only a few small contracts were bid on this week. Prices continue unchanged.

Spiegeleisen and Ferro-Manganese.—Quotations are: Spiegeleisen, 20%, \$19@19.50; ferro-manganese, 80% foreign, \$46, delivered at buyer's mill.

Steel Billets and Rods.—This market continues to show only fair business. Wire rods continue quiet, with prices unchanged. Quotations are \$17@17.25 for billets at tidewater and \$21 for rods at m. l.

Merchant Iron and Steel.—The trade in merchant material continues steady. Quotations are: Common bar, 1@1.05c.; refined, 1.10@1.15c.; soft steel bars, 1.10@1.15c.; steel hoops, 1.25@1.35c.; steel axles, 1.40@1.60c.; tire steel, 1.05@1.10c.; spring steel, 1.35@1.40c.; links and pins, 1.50@1.60c.; cotton ties, 60c. per bdl. at mill.

Plates.—Business is of small proportion. We quote for universal mill plates 1.10@1.15c. For steel plates prices are: Tank, 1.10@1.20c.; boiler shell, 1.25@1.30c.; flange, 1.30@1.40c.; firebox, 1.60@1.75c., and 2.25@2.50c. for locomotive firebox, according to quality. Charcoal iron plates are 2.25c. for shell, 2.75c. for flange and 3.25c. for firebox. Rivets are 2.25@2.50c. for iron and 1.75@1.85c. for steel. Prices are for tidewater delivery in large quantities.

Structural Iron and Steel.—This market continues unchanged, and the orders taken are for immediate wants. We quote for angles, 1.10@1.15c.; tees, 1.25@1.35c.; channels, 1.15@1.25c. The price of beams, New York delivery, is 1.15c. for ordinary sizes, 1.20c. for 20-in., and 1.25c. for 24-in., carload lots.

Steel Rails and Rail Fastenings.—Business is limited, but there is promise of more buying in the near future. Quotations for steel rails are \$19@20 per ton for standard sections and \$23 for girder rails. Lighter rails are figured on by reliable concerns as follows: 12-lb. rails, \$26 per ton at mill; 16-lb., \$24; 20 lb., 25-lb. and 30-lb., \$22; 30 lb., \$20.50.

Only moderate business continues to be reported in rail fastenings. Tidewater quotations are: Angle bars, 1.05@1.10c.; spikes, 1.40@1.50c.; bolts, 1.75@1.85c.; square nuts, 1.80@1.85c.; hexagon nuts, 1.90@1.95c.

Wrought-iron Pipe.—Business is fair at unchanged prices.

Nails.—For wire nails the market continues to show a good tone, but the orders are principally for small quantities. Cut nails are being purchased moderately. Quotations are: Wire nails, in carload lots, \$1.35@1.40 per keg from mill; smaller quantities, \$1.50@1.60, New York. Cut nails, in carload lots, \$1.33 per keg, New York; \$1.31, Philadelphia; \$1.35, Boston; \$1.30, Baltimore; \$1.33, Albany, and \$1.27, Buffalo. For smaller quantities from store at New York, \$1.43@1.45 is quoted.

Old Material.—This market shows an improvement this week, and prices for steel scrap material are stronger. Sales made were 340 tons standard section steel T rails at about \$9.50 per ton, f. o. b. cars Jersey City, and 400 tons standard scrap at \$11.50 per ton, delivered at buyer's works. Quotations are: Iron T rails, \$11@12 per ton; scrap steel rails, \$9.50@10.50, and relays, \$13.50@15; hammered car axles, \$15@16; No. 1 wrought scrap iron, from yard, \$9@10, and from railroad, \$10.50@11.50 per ton, all f. o. b. cars; car wheels, \$8.50@9.50 per ton, delivered at buyer's works; machinery cast scrap, \$8.50@9.50 per ton; wrought pipes and tubes, \$7@8, delivered, New York; wrought turnings, \$7@8 per ton; cast borings, \$6@7; burnt iron, \$5@6, delivered at mill.

Buffalo. Sept. 1.
(Special Report of Rogers, Brown & Co.)

There has been an unquestionable hardening of pig iron prices during the week just past, not alone with those furnaces in this vicinity, but also those tributary to this territory. It is reported to-day that almost all the Valley furnaces have recently made heavy sales, and in some cases are asking a material advance over prices going a week ago. Several foundries that but a short time ago believed they had sufficient supplies purchased to cover their requirements for some time to come have found it necessary to duplicate their orders. The

sharp advance in Southern iron which took place this week has not been felt in this immediate vicinity, as for some time past this metal has been above the local market. The only effect it had was to somewhat increase the tonnage booked by local furnaces. We revise our quotations to the basis mentioned, cash, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$10.50; No. 2 strong foundry coke iron, Lake Superior ore, \$10; Ohio strong softener No. 1, \$10.75; Ohio strong softener No. 2, \$10.25; Jackson County silvery, No. 1, \$14; Southern soft No. 1, \$11.35; Southern soft No. 2, \$10.85; Niagara malleable, \$10.25 per ton.

Chicago. Sept. 1.

(From Our Special Correspondent.)

Pig Iron.—The principal item of interest during the week is the advance of 25c. to 50c. per ton agreed upon by both Northern and Southern furnaces on foundry iron. Another conference will soon be held, in which an attempt will be made to better regulate prices on pig irons and to arrange for harmony in both Northern and Southern pig-iron interests. The local furnaces report a very fair business for the week, orders continuing to come in for a good volume of business and inquiry indicating a continuation of present active trade. Sales for the week have been numerous, running from carload lots up to one of 1,500 tons, the demand being more for Northern iron than Southern. There is considerable buying by concerns that some time ago were supposed to have contracted for a sufficient quantity of iron to last them for the season, but brighter conditions have sent them back into the market for more iron. Lake Superior charcoal, \$13@13.25; local coke Foundry No. 1, \$10.75@11; No. 2, \$10.50@10.75; No. 3, \$10.25@10.50; local Scotch foundry No. 1, \$10.75@11; No. 2, \$10@10.25; No. 3, \$10.25@10.50; Southern Coke No. 1, \$10.60@10.85; No. 2, \$10.10@10.35; No. 3, \$9.85@10.10; Southern No. 1, soft, \$10.35@10.60; No. 2, \$9.85@10.35; Southern silveries, \$10.35@10.60; Jackson County silveries, \$12.50@14.50; Ohio strong softeners, \$12@12.25; Alabama car wheel, \$15.50@16; malleable Bessemer, \$10.75@11; coke Bessemer, \$11.50@12.

Bar Iron.—There continues a great demand for bar iron because of the numerous orders placed by the railroads for cars. Sales have run all the way from 750 tons down. Inquiry is increasing. Prices are quite firm, common iron being quoted at 1.05@1.10c. and guaranteed at 1.20c.

Steel Rails.—Business in heavier sections of rails continues active, considerable having been booked during the week. Demand for the lighter sections is so fair, and in consequence the local mills are quite filled with orders. The Illinois Central Railroad, it is said, will in the near future relay its entire main line, a distance of 365 miles, with 100-lb. rails, such rails being the heaviest ever used on a railroad in the West. Rails are quoted at \$19@21, according to specifications.

Billets and Rods.—A big business in both rods and billets has been closed during the week by the local mills. Rods were in chief demand and orders for several thousand tons were booked. Prices on billets appear very firm and indicate an early advance. Billets are still quoted at \$15 and rods at \$21.

Structural Material.—There has been no large business placed during the week, but there remains a good steady run of small orders. Bridge material is in most demand, and track elevation on several of the railroads centering here keeps the market interesting at the present time. Beams and channels are quoted 1.15@1.20c., angles 1.10@1.15c., plates 1.10@1.15c., tees 1.30@1.40c.

Cleveland. Sept. 1.

(From Our Special Correspondent.)

Iron Ore.—The market may be said to be strong at the present time. A very fair volume of business has been transacted during the past week, and has not only involved a number of small sales, but some of considerable amount. Non-Bessemer ores are said to be especially active and strong, and if the sellers are able to realize higher prices a little later in the season, the ore agents of the city will not be surprised.

The movement of ores has been lively. The same freight rates prevail, however, 50c. from the head of the lakes and 45c. from Escanaba. It is thought that the Escanaba rate will be advanced soon, in which event the Lake Superior rate will also be advanced.

Following are the prevailing ore prices: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@2.75; hematite ores, Bessemer quality, \$2.50@3; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—Although sales have been made in both Bessemer and foundry irons during the past week, the market has been only moderately active. Slightly higher prices are expected in the near future. The present quotations follow: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@10; No. 1 Foundry, \$10.25@10.50; No. 2, \$9.75@10; No. 1 Ohio Scotch, \$10.40; No. 2, \$9.90; gray forge, \$8.50@8.75.

Philadelphia. Sept. 3.

(From Our Special Correspondent.)

Pig Iron.—Agents of home and remote furnace companies have had it given out that as soon as the larger consumers of pig iron begin to provide for winter requirements, which they say they will shortly do, iron will begin to advance in earnest.

Buyers of iron have the impression that there is a great deal of accumulated iron on hand at furnaces, and they believe, or at least argue, that holders will be quick to freely offer this on the first rise in demand and that this will keep prices down. Whether there is anything in this line of reasoning or not, prices remain about where they were, in spite of a large amount of business having been done two to three weeks ago. There is a strong desire to sell, but holders and makers think this is a bad time to reduce prices and buyers resent any attempt to advance prices.

Quotations are: No. 1 X foundry, \$11.75@12.5; for No. 2, \$10.75@11.25; plain, \$10.50; standard mill, \$10@10.50; ordinary, \$9.50@9.75; Basic, \$10.50; low phosphorus, \$15; Bessemer, \$12.

Billets.—Sales were made yesterday and to-day, but both sides decline to give figures, sellers claiming \$17.25 is bottom. Private advices from Pittsburgh have induced considerable business this week in moderate-sized lots and offers are under consideration to-day for large lots.

Merchant Bars.—While manufacturers elsewhere are said to be doing well, business here is of moderate proportions. If there is any improvement it is in steel bars. Pig-iron people who have been trying to work off forge on the millmen say they are hard to move. Refund averages 1.10@1.15c.

Sheet Iron.—Large users are on the tip-toe of expectations, manufacturers say, for concessions asked for on large orders. Millmen in the first place are not particularly anxious about booking long running orders at current figures, but occasionally do so rather than let it be taken at some other mill.

Merchant Steel.—Our week to week sales are of fair magnitude. Prices are firm.

Pipes and Tubes.—In accordance with action taken elsewhere, quotations on merchant pipe have been advanced and a good week's business, not all of it at the advance, has been done. A good demand is now coming along.

Plate and Tank.—Shipyard work is swelling the volume of business and buyers are gradually becoming more particular as to when they want their stuff. Those who understand the situation clearly yielded this week to a fractional advance for the assurance that the iron they wanted would be surely delivered next month. Bridge material is urgently wanted and in large quantities. An advance is very probable; in fact, quick deliveries are already a tenth higher. Quotations: 1.15c. for tank; 1.20c. for universals; 1.30c. for flange.

Structural Material.—The market is firm for all kinds of construction material. No concessions can be had on ordinary business coming along. If we were sure our competition could not accommodate large buyers as they want their material, we would mark prices up even on inquiries for large lots. Angles are 1.20c.; beam and channels, 1.25c.

Steel Rails.—Enquiries for rails for export were received this week, one lot for export having been already announced. Authorities on rails say there is a better feeling. Quotations, \$19.50@20.

Old Rails.—The sales are larger and prices quoted slightly higher, but agents for buyers say this fact, if it be correct, will not affect them on purchases; they are at liberty to make any time this month. Iron rails, \$12; old steel rails, \$11.

Scrap.—Quite an improvement is spoken of in all kinds of scrap. Steel axles are salable at \$11.50; old car wheels at \$9.50; choice railroad scrap at \$12; boiler and tank clippings at \$10.25.

Pittsburg. Sept. 2.

(From Our Special Correspondent.)

Raw Iron and Steel.—Business in most departments shows up exceedingly well, and the fall trade is opening up in good shape. Buyers are evidently aware of the fact that an active fall and winter season is before them. The sales of iron and steel and many other products the past two weeks were the largest of the year for the same length of time; the Valley sales of Bessemer were very large, which placed the furnaces in a very good shape; the sales extended to March, 1898, which goes to show that the large mills are well stocked with orders for next year.

Reports from all sections of the country have been very favorable, showing that the improved condition of affairs are general, not local. For instance at Steelton, where the Pennsylvania Steel Works employs over 4,000 men, every department is busy, the output of the rail mill was very heavy and the open-hearth department is increasing its output. The inquiry for estimates and prices were numerous. The volume of transactions in pig iron is increasing and would have been larger providing prices could have been made satisfactory to both parties. Manufacturers are unwilling to book orders for long delivery, except at advanced figures, and even when higher prices are paid, deliveries beyond 1897 are not readily agreed to. It is expected that a new basis of quotations will have to be made in the near future. Steel is very firm and active, yet, large transactions being reported at several points. The Schuylkill Valley Mills have orders to roll 20,000 tons steel for the Chester Pipe and Tube Works, the steel being furnished by the Troy Iron and Steel Company.

Finished Material.—The activity noted in my last report has been continued, mills in this vicinity are running full; many of them have warehouses

orders booked to keep them employed for some time. The advance in prices has been general, a further advance is said not to be far off.

Market for wrought iron and steel pipe is firm, with an increased demand, the advance recently noted has been maintained. It is reported that the mills have all the orders booked they want. Many of the orders are for distant points.

Sheet Bars are firm, with a large volume of transactions; prices tend upward. Wire rods are firm and active; heavy sales are reported at a further advance.

Wire Nails.—Market active and very firm; heavy sales are reported at an advance of 8 to 10c. per keg; nominal rates, \$1 30@1 35.

Firmness was the rule in the market, not the exception. Bessemer pig is steady and prices are maintained. Furnace men say that from this time on buyers will have to do the trading. Steel billets are firm and active at last week's prices. Mill and foundry irons are steady, but not active. Sheet bars are firm and prices were advanced from 25 to 40c. Skelp iron and steel advanced 5c. all round. Old rails iron and steel commands more money and so does scrap material. Valley furnace men are firm in their views and some are already asking a further advance for 1898 delivery.

COKE, SMELTED, LAKE AND NATIVE ORK.

Table with columns for Tons, Cash, and Val. listing various grades of coke and their prices.

CHARCOAL. 100 No. 1 Fdy., Pitts. \$15.00. 50 No. 2 F., Pitts. 15.25. 50 Warm Blast, P. 13.40. 50 Cold Blast, Pitts 22.00. 50 Cold Blast, ex., P. 26.00.

Table with columns for Blooms, Billets, Slabs, and their respective prices.

Table with columns for Muck Bar, Sheet Bars, and their respective prices.

METAL MARKET.

NEW YORK, Friday Evening, September 3, 1897. Gold and Silver.

Price of Silver per Ounce Troy.

Table showing the price of silver per ounce troy for August and September, with columns for St. Ex., London, N. Y. Cts., and Value of sil. in \$.

The silver market made a new record this week, spot silver selling at 51 1/2c., owing to the continuance of same conditions in the London market of scant demand and pressure of sales.

The closing to-day, however, is strong on Mint orders in London, spot silver selling here at 52 1/2c. London writes under date August 23d: "There has been a moderate enquiry for shipment to the East, but sales of the metal in the Indian bazaars have been a good deal restricted, owing to the fear of an increased import duty being imposed upon the metal. The future of the market is most uncertain, and no permanent rise of importance seems probable without a decreased production."

Gold and Silver Exports and Imports

At all United States ports, July, 1897, and years from January 1st, 1887 and 1896:

Table showing Gold and Silver Exports and Imports for July 1897 and years from 1887 to 1896.

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

Gold and Silver Exports and Imports, New York

Table showing Gold and Silver Exports and Imports for New York for the week ending September 3d, 1897, and for years from January 1st, 1897, 1896, 1895, 1894.

No gold was exported this week; of the silver \$780 went to South America and the balance to London. The gold and silver imported came chiefly from Central America and the West Indies.

The United States Assay Office in New York reports the total receipts of silver at 86,000 oz. for the week.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Table showing Average Monthly Prices of Silver in New York and London for 1897, 1896, and 1895.

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal 925 fine.

FINANCIAL NOTES OF THE WEEK.

Small notes to the amount of \$100,000 were transferred by the United States Treasury to Kansas City on September 3d, for which it received gold in exchange, and \$15,000 in silver dollars to Texas and Alabama. Heavy shipments are also reported by bankers to the West and Southwest, but not much is going to the South.

The Nicaraguan government has been petitioned by the merchants of the country to place its currency on a gold basis, owing to the present deplorable state of finances there.

The Secretary of State for India, in Council, gives notice that the sale of bills of exchange on Calcutta, Bombay and Madras has been suspended for at least ten weeks. This action is due to the poor financial condition of the country. The opinion exists in banking circles in London that gold will be shipped to India when business revives.

The coinage executed at the Mints of the United States during August and the eight months of 1897 is reported by the Treasury Department as follows:

Table showing coinage executed at the Mints of the United States during August and the eight months of 1897.

The statement of the United States Treasury, on Thursday, September 2d, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

Table showing Treasury balances in excess of outstanding certificates for August 26 and September 2, 1897.

Treasury deposits with national banks amounted to \$16,982,257, a decrease of \$280,728 during the week.

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 holdings at the corresponding dates last year:

Table showing specie holdings of leading banks of the world at the latest dates covered by their reports.

The return for the Associated Banks of New York is of date August 28th; all the others are of August 17th, except the Bank of Italy, July 30th, the Bank of Russia, July 23d-August 4th, the Bank of England and the Bank of France, September 2d. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending August 28th gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

Table comparing the statement of New York banks for the week ending August 28th with corresponding weeks in 1896 and 1895.

Shipments of silver from London to the East for the year up to August 19th are reported by Messrs. Pixley & Abell's circular as below:

Table showing shipments of silver from London to the East for the year up to August 19th.

Arrivals for the week this year were \$189,300 in bar silver and \$1,000 in Mexican dollars from New York, and \$15,750 in bar silver from the West Indies; a total of \$206,050. Shipments for the week were \$218,500 in bar silver to India; also \$28,350 in Mexican dollars to the Straits, and \$22,434 to China; a total of \$269,284.

Prices of Foreign Coins.

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

Table showing the latest market quotations for leading foreign coins.

Other Metals.

Copper.—The market is devoid of any new feature. The volume of business continues to improve, though slowly, and prices remain very firm indeed, with a tendency to advance. Producers are not quoting freely, and were it not for the fact that manufacturers are disinclined to anticipate their future wants, prices could be marked up considerably.

The foreign demand is again very brisk, and the shipments during this month will undoubtedly be very much heavier than they were during August, so that the quantities available for home consumption are not likely to be in excess thereof.

We quote Lake copper at 11 1/2@11 3/4c.; electrolytic copper in cakes, wirebars or ingots at 10 1/2@11c.; cathodes at 10 1/2@10 3/4c.; and casting copper at 10 1/2c.

The foreign market, which closed last week at \$48 15s, at the beginning of this week opened at \$49 for spot and \$49 7s. 6d. for three months, advanced since to \$49 2s. 6d. and \$49 10s. respectively. The improvement, however, has not been fully maintained, the market having receded to \$48 15s., but has since recovered, closing to-day at \$48 17s. 6d. for spot and \$49 5s. for three months prompt. For refined and manufactured we quote: English tough, \$51 10s. @ \$51 15s.; best selected, \$52 @ \$52 5s.; strong sheets, \$53 10s.; India sheets, \$55 10s. @ \$56; yellow metal, 5d. The statistics for the second half of August show a decrease in the visible supplies of 300 tons.

Tin is not in quite as good demand as it has been, and the result is an entire disappearance of the premium on spot, which is now selling at 13 1/2c. The supplies which have come to hand during the last two weeks have been somewhat more plentiful, but not sufficiently large to disturb the market.

The foreign market, which at the beginning of the week opened at about the same figure as it closed at the end of last, has since declined to \$201 2s. 6d. for spot and \$201 12s. 6d. for three months prompt, which are the closing figures.

Were it not for the renewed decline in silver, prices for tin would undoubtedly have improved, the statistics at the end of August again showing an improvement of 800 tons. Under different conditions for silver, this would without doubt have had a very favorable influence on values.

The shipments of tin from Australia and the Straits in August are estimated at 4,000 long tons, and the deliveries for the month at 5,005 tons. The visible supplies on September 1st were as follows, in tons of 2,240 lbs.:

Table showing visible supplies of tin on September 1st.

The total supply shows an increase of 820 long tons from August 1st, and of 2,013 tons as compared with September 1st, 1896.

MINING STOCKS.

Complete quotations will be found on pages 296, 297 and 298 of mining stocks listed and dealt in at:

Aspen.	Helena.	London.
Baltimore.	Los Angeles.	Mexico.
Boston.	New York.	Paris.
Cleveland.	Philadelphia.	Rossland.
Colo. Springs.	Pittsburg.	Shanghai.
Denver.	Salt Lake.	Valparaiso.
	San Francisco.	

New York. Sept. 3.

Although speculation in the local mining market was fairly active, the trading, is still confined to a few stocks. On the Consolidated Stock and Petroleum Exchange the Comstocks were firmer compared with last week, and several advances were recorded. The Colorado stocks, especially those of the Cripple Creek group, fluctuated to some extent. The silver stocks continue to be depressed in consequence of the falling price of the metal. The California securities were very quiet.

The most active stock on this Exchange is Fortuna, which is quoted at \$10.62 to \$11.25 per share.

The Mining Exchange is doing a moderate business, which is confined principally to a few Colorado stocks, such as Rocky Mountain, Annetta and Miami. The chairman of this board is in the habit of calling the Cripple Creek stocks, and although bids are made there is little or no buying in this direction.

Boston. Sept. 2.

(From Our Special Correspondent.)

The general tone of the copper share market is bullish to a moderate degree, influenced by the expectation of higher prices for ingot copper. A feature of the market this week was the announcement of another \$10 dividend by the Calumet & Hecla, payable October 1st. The dividends for the calendar year to date have been as follows: \$15 February 10th; \$5 April 23d; \$10 July 10th and October 1st, being \$40 per share to date, with a grand total by the mine of \$50,850,000, and it is quite likely that another \$10 payment (\$1,000,000) will be made before the year closes.

As compared with last week Arnold advanced $\frac{3}{4}$ % to $\frac{3}{8}$ %, then fell off to $\frac{3}{16}$ % and closes $\frac{3}{16}$ %. Atlantic was $\frac{3}{4}$ % up to $\frac{2}{8}$, then off to $\frac{2}{8}$. Calumet & Hecla gained from \$415 to \$435 (the highest record), influenced by the dividend referred to above. Centennial has been unusually active, going off first from \$11 to $\frac{3}{8}$ % and then a sharp rallying to $\frac{11}{16}$ %. Accounts from the mine are of an exceedingly favorable character and the managers are greatly encouraged in the belief that they have a valuable property. Franklin declined at first from $\frac{17}{16}$ % to $\frac{16}{16}$ %, and then rallied to $\frac{17}{16}$ %. Accounts from Franklin, Jr., are excellent, and the promise is good for the old Franklin to resume her place among the dividend payers at no distant day. Kearsarge advanced from $\frac{20}{16}$ % to $\frac{21}{16}$ %, and closed at $\frac{20}{16}$ %. Osceola was very quiet with small transactions around $\frac{38}{16}$ and $\frac{38}{16}$ %. Quincy was $\frac{1}{2}$ % higher at $\frac{19}{16}$, with a steady buying demand. Tamarack, which has been showing firmness for some time, advanced from $\frac{134}{16}$ to $\frac{137}{16}$. There is no doubt of a \$3 dividend in December, and the possibilities are an increased rate. Tamarack, Jr. advanced from $\frac{19}{16}$ to $\frac{20}{16}$ and later back to $\frac{19}{16}$. Wolverine from $\frac{14}{16}$ to $\frac{14}{16}$, and closes $\frac{14}{16}$ per share.

Boston & Montana holds its own remarkably well, advancing from $\frac{143}{16}$ to $\frac{144}{16}$, and the market has been specially active through the week. This company has settled down to certain \$3 quarterly dividends and takes on much more of an investment character than heretofore. Butte & Boston, which fell off last week to $\frac{26}{16}$, rallied to $\frac{28}{16}$, with later sales at $\frac{26}{16}$, and then rose to $\frac{27}{16}$. Old Dominion has hung around $\frac{18}{16}$ to $\frac{19}{16}$ without special features.

Gold stocks have been more active than previously and Merced was the feature of the market, advancing from $\frac{5}{16}$ to $\frac{8}{16}$, with a vigorous movement. Pioneer also came in for its share, gaining from $\frac{56}{16}$ to $\frac{58}{16}$, with unusually large transactions early in the week. Santa Isabel is steady at $\frac{15}{16}$ to $\frac{15}{16}$, and there is a general feeling that the property is selling too low.

3 p. m.—The market in the late hours did not show so much activity as heretofore, and generally prices were a little off. Calumet & Hecla was an exception, scoring a \$5 advance from the early morning transactions. Montana was very quiet around $\frac{144}{16}$ to $\frac{144}{16}$, and Butte went off to $\frac{26}{16}$. The remainder of the list was fractionally lower and somewhat neglected, owing to the larger interest in railroad stocks.

Cleveland. Sept. 1.

(From Our Special Correspondent.)

The mining stock market has an upward tendency at present. During the past week, a number of the securities offered for sale have advanced in value. The owners of Republic want a little more for their property, and investors are offering \$2 per share more for Lake Superior, Cleveland-Cliffs and Minnesota.

Los Angeles, Cal. Aug. 23.

(From Our Special Correspondent.)

The market on the Los Angeles Exchange was steady and fairly active this week. The extreme hot weather has undoubtedly had its effect on the trading in mining securities. The bears, who always take advantage of anything like a hot day, have been more or less successful all through the week, although the lack of trading interest more than

offset any attacks they could make, as little or no long stock could be shaken out.

Two new properties have been listed: The Gold Bug Mining and Milling Company, situated in the Radamacker District, adjoining the Rand Mining District on the north. This company is incorporated for 2,000,000 shares, par value \$1; 500,000 shares being placed in the treasury for working the property. It owns two full and well-developed claims. The ore is not entirely free-milling, but it is believed the cyanide process will handle it to good advantage. Engineer's report and plat of property are already on file at the Exchange office.

Salt Lake City. Aug. 28.

(From Our Special Correspondent.)

Trading was fairly active during the week, but is still far below normal, and will probably continue to be so as long as silver remains anywhere near present figures. Yet the depreciation of silver is not without its compensations. While values were high, the wildcat mine easily found its way into the inner circle, but with the decline came a closer scrutiny, and stocks that have had local quotations for the benefit of purchasers abroad, are now entirely ignored.

Ajax continues strong, although no shares have changed hands. Bullion-Bek is shaded but is honored with bids equal to 75% of the price asked. Centennial-Eureka is down, being offered at \$25, without takers. Choride Point is doing no business in the stock locally. The management reports that construction has begun on the cyanide mill and it should be completed before the close of the year. This property is remarkable in that it has produced enough ore of a shipping grade, during development, to pay all running expenses.

Neither of the Dalys did business, though both are honored by standing bids. In the case of Daly-West it is easy to account for an inquiry, and the management could at any time commence the extraction of silver-lead ore. With Daly it is different, as the shares are without a single attractive feature with silver anywhere below 75c. Dexter is shaded in the bid, but is firmly held, with but limited offerings of stock. There is no immediate prospect of the property passing out of present control.

Geysier-Marion recovered considerable lost ground during the week, without apparent cause, and sold at \$1.15. The question of the pending dividend—usually paid on the 31st—is not yet disposed of, but a meeting of the directors is promised on that date, at which a reorganization of the board and officers is expected. The directors admit that the possibility of an August dividend is remote, and state that if one is declared it will not be paid till September 15th.

Mammoth continues lifeless, and the stock has changed hands at \$1. A change in management, without, however, any alteration of the present board, is looked for on September 1st. There is nothing to relate in regard to Mercur. The stock keeps up and sold at \$7.75.

Northern Light took a tumble during the week, selling at 60c., with more at the same price in sight. No statement of value of the last batch of cyanides has been made public, but it is rumored that the percentage of gold values was low compared with the silver. Ontario is lifeless.

Sacramento is fairly active and is in good demand though at shaded figures. Nothing definite is yet announced either in regard to an early dividend or a new mill. Sunshine continues to attract attention, though the management announces that nothing decisive has been decided upon in regard to a resumption of work. Swansea and South Swansea each found buyers last week, the former at \$1; the latter at 60c. Each property could draw on reserves of silver-lead ore, and earn something over operating expenses, but the managements are not making a feature of extraction in the present condition of the market.

San Francisco. Aug. 28.

(From Our Special Correspondent.)

The market opened with slightly higher prices, but buyers' orders were few. As the week advanced business became quiet, and at the close today, it is dull. The Comstocks stocks were fairly well maintained in price during the week. Some quotations were as follows: Consolidated California & Virginia, \$1.20; Hale & Norcross, 85c.; Union Consolidated, 40c.; Gould & Curry, 43c.; Mexican, 22c.; Yellow Jacket, 34c.; and Savage, 27c.

The Anchor Mining Company, of Tuolumne County, has levied an assessment of \$1 per share, delinquent September 14th.

The Belcher assessment of 10c. per share was delinquent in the company's office, August 23d.

The Rockland Gold Mining Company, of Nevada County, has levied an assessment of 15c. per share, delinquent September 20th.

The delinquent assessment sale of the San Francisco & San Joaquin Valley Coal Company has been postponed to September 6th; that of the Best & Belcher Mining Company was held August 26th, and of the 289 shares of stock unpaid 154 shares were sold, which is the smallest number in many years.

London. Aug. 25.

(From Our Special Correspondent.)

The boom in South Africans has pretty much died out, and the quotations all round have receded from their highest point. There is no doubt that the hitch in the adoption of the Transvaal mining commission's recommendations is the cause of this

lull. Everyone supposed that the recommendations would be adopted at once, but now it appears that both the Raad and the government are putting difficulties in the way, and generally showing that they do not relish reforms. Every day comes public and private news of contradictory character about this matter, so no wonder the public holds aloof. It is generally felt, however, that the reforms will have to come, and that President and Raad will have to give way. Then the reduced output of the gold mines has had a rather depressing effect. It was rumored several times that the reported figures were incorrect, but there seems to be no ground for such a belief. In particular the Robinson yield was said to be too low, but on inquiry at the offices of the company in London I was informed that there was no error in the figures, and that the output was really 5,000 oz. less than the previous month, partly on account of the temporary scarcity of labor, and partly on account of the short supply of bought concentrates.

The only item of a favorable character that I have heard this week is the strike of a rich vein on some hitherto unprospected land belonging to the Randfontein estate. No details are as yet forthcoming and the strike has not yet been publicly used on the market.

The West Australian section has been fairly brisk owing to the results at Kalgoorlie & Great Boulder. A good deal of buying comes from people on the spot who should know what the future developments will be.

Mount Lyells have still been much forward and the price has mounted higher to £14 10s. From what I hear I am inclined to believe that there is a quiet rivalry going on between a hitherto outside element and the controlling interest. The present buying is caused by the desire of a particular group to obtain the control of the company. Should this group gain control it is likely that the shares would be split and the present £3 shares done away with for some more convenient denomination.

Canadian and Klondike companies have again been prominent this week. A small company has been advertised privately called "The New Klondike Goldfinders, Limited." It is promoted by a cycle company, and the expedition is to consist of three men who are expert cyclists. The prospectus reads as if it was proposed that they should prospect on their cycles, and indeed to travel to the country by that method of locomotion. But would not the only use for a scorcher in that country be to thaw out the frozen placer ground? This company, however, need not be criticised seriously, as nothing will come of it.

A fortnight ago I mentioned that a new company had been formed called the Klondike & Columbian Gold Fields Limited. This company has commenced the formation of subsidiary companies, but its first born are twins which are neither Klondike nor Columbian, but Rainy Lake Ontario. Its name is "New Golden Twins Ontario, Limited." The properties are the mining locations 327 X and 328 X situated on the west side of Clearwater Lake, 35 miles from Bonheur station on the Canadian Pacific Railway. Mr. H. A. Wiley, of Hawk Bay mine closely adjacent has been appointed manager, and Mr. F. S. Wiley, of the also adjacent Saw Bill gold mine, and Mr. Johnson Brown have reported favorably on the properties. From these gentlemen's reports it appears that no development has been done, and that the vein is an untried out crop. On the surface it averages \$9 free milling gold over a width of 6 to 29-ft., and it contains an unspecified amount of copper and iron pyrites and galena. Instead of spending a few thousand dollars in testing the vein for depth the vendors are desirous of selling it to the public for \$60,000, of which half is to be in shares and half in cash; but if the cash is not all forthcoming they are willing to take \$13,000 in cash and \$47,000 in shares. The total capital is \$60,000, so that if the money they ask for is all subscribed there will be \$30,000 in cash as working capital. As a matter of experience the total cash asked for is never subscribed. They generally get a few thousands to complete the purchase with and start work. They take shares for their purchase consideration and peddle them out to anyone who is foolish enough to go in. The money thus raised goes, of course, to the promoters and not to the company and the mine. This seems to be the prospect for the Golden Twins.

LATE NEWS.

[BY TELEGRAPH.]

CRIPPLE CREEK, COLO., Sept. 3.—The output of the Cripple Creek District during the month of July amounted to 24,500 tons of ore of the total value of \$1,100,000.

A certificate from the Secretary of State of New Jersey was filed with the Secretary of State of Utah, August 28th, setting forth that the capitalization of De La Mar's Mercur mines is \$250,000, in shares of \$100. J. R. De La Mar, Paris, France; W. N. Cromwell and George H. Sullivan, of New York; H. B. Parson, Brooklyn, and W. J. Curtis, Summit, N. J., are the incorporators. Head office is at Jersey City, with principal place of business outside of New Jersey at Salt Lake. The low capitalization is noteworthy, in view of the outlay, probably of \$500,000, for purchase and exploration of the large acreage of auriferous ground at Mercur, besides the cost of the mammoth mill now in process of construction, to be finished in 90 days. No intimation is supplied of what the property of this company embraces.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Anaconda, and others with columns for location, par value, and prices for various dates from Aug. 28 to Sept. 3.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies like Alamo, Anaconda, and others with columns for location, par value, and prices for various dates from Aug. 27 to Sept. 2.

* Official quotations Boston Stock Exchange. * Bid and ask quotations. Total sales, \$2,165.

BALTIMORE, MD.

Week ending Sept. 2.

Table of stock quotations for Baltimore, Md., listing companies like Atlantic Coal, Big Vein Coal, and others with columns for location, par value, and prices.

* Official quotations Baltimore Stock Exchange.

CLEVELAND O.

Table of stock quotations for Cleveland, O., listing companies like Aurora, Cleveland-Cliffs, and others with columns for par value, bid, ask, and prices.

* From our special correspondent.

ASPEN, COLO.

Aug. 27.

Table of stock quotations for Aspen, Colo., listing companies like Agnes C, Argenta, and others with columns for location, capitalization, par value, and prices.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Alamo, Anaconda, and others with columns for par value, bid, ask, and prices for various dates from Aug. 23 to Aug. 28.

* Official quotations Colo. Springs Mg. Stock Assoc. Total shares sold, listed, 446,387.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stocks, listing companies like American Coal, Col. Fuel & I., and others with columns for par value and prices for various dates from Aug. 28 to Sept. 3.

* Official quotations. New York Stock Exchange, mining, 1,000 shares; other stocks 150.62 shares; Consolidated Stock and Petroleum Exchange, mining, 27,500 shares; Mining Exchange, 285,000 shares. Total shares sold, 461,123. * Bid and ask quotations. † Ex-div.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Cambria Iron, Choc & Gif. Cliffs, and others with columns for location, par value, bid, ask, and prices.

* Official quotations Philadelphia Stock Exchange. * Bid and asked quotations. † Ex-div. Total sales, 16,283.

PITTSBURG, PA.

Aug. 30.

Table of stock quotations for Pittsburgh, Pa., listing companies like Allegheny, Cumberland, and others with columns for location, par value, bid, ask, and prices.

* Official quotations Pittsburg Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing various companies and their share prices from August 23 to August 28, 1897.

LOS ANGELES, CAL.

Table of stock quotations for Los Angeles, Cal., listing various companies and their share prices from August 16 to August 21, 1897.

Official quotations, Los Angeles Mining and Stock Exchange. * Bid and ask quotations. Total sales, 97,000 shares.

SALT LAKE CITY, UTAH.

Week ending Aug. 28.

Table of stock quotations for Salt Lake City, Utah, listing various stocks and their bid/ask prices.

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

ROSSLAND, BRITISH COLUMBIA.

Aug. 25.

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

* From Our Special Correspondent.

HELENA MONT.

Week ending Aug. 11.

Table of stock quotations for Helena, Mont., listing various companies and their share prices.

* Special Report of Samuel K. Davis. Total shares sold, 5,900.

SAN FRANCISCO, CAL.

Table of stock quotations for San Francisco, Cal., listing various companies and their share prices from August 27 to September 2, 1897.

* Official telegraphic quotations, San Francisco Stock Exchange.

MEXICO.

Week ending Aug. 20.

Table of stock quotations for Mexico, listing various companies, their states, and share 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 \$5 or \$10. Prices are in Mexican dollars.

STOCK QUOTATIONS.

LONDON.

Aug. 20

PARIS.

Week ending Aug. 19.

Table of stock quotations for London, listing company names, countries, authorized capital, par value, last dividend, and quotations (buyers/sellers).

Table of stock quotations for Paris, listing company names, countries, products, capital stock, par value, last dividend, and prices (opening/closing).

*From our special correspondent.

VALPARAISO, CHILE.

July 17.

Table of stock quotations for Valparaiso, Chile, listing company names, locations, capital paid, share value, last dividend, and prices.

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

SHANGHAI, CHINA.

July 30.

Table of stock quotations for Shanghai, China, listing company names, countries, number of shares, value, last dividend, and price.

* Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

DIVIDENDS.

Table of dividends for various companies, listing company names, current dividends, paid since Jan 1, 1897, total to date, and names of companies.

ASSESSMENTS.

Table of assessments for various companies, listing company names, locations, number of shares, date, and amount.

NOTE.—This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the Engineering and Mining Journal will confer a favor on the publishers if they will notify the Journal of any errors or omissions in the above table. * August dividend paid.

* New assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Table with columns: Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last). Rows 1-121.

Table with columns: Name and Location of Company, Capital Stock, Shares (No., Par Val), Assessments (Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last). Rows 1-121.

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,390,000 in dividends and the Cons. Virginia \$42,390,000. § Dividends paid since consolidation. || Bode, Butler and Mono transferred to Standard Cons., January, 1897. ¶ Dividends have not been paid in several years.

Note—This table is corrected up to September 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

RARE ELEMENTS, CHEMICALS AND MINERALS—CURRENT PRICES.

NOTE.—This table is revised up to August 12th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.

CHEMICALS AND MINERALS.

These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts.

Table of Chemicals and Minerals prices including items like Abrasives, Acids, Ammonia, Alum, Aluminum, Antimony, Argols, Arsenic, Asbestos, Asphaltum, Barium, Barytes, Benzoin, Bismuth, Bitumen, Bone Ash, Borax, Bromine, Calcium, Cement, China Clay, Chlorine, Chrome Ore, Cobalt, Copperas, Feldspar, Flint, Fluorspar, Fuller's Earth, Gypsum, Iodine, Iron, Kaolin, Lead, Lime, Magnesia, Marble, Mercury, Mineral Wool, Nickel, Nitre, Potash, Pyrites, Quartz, Sal Ammoniac, Salt, Silica, Strontium, Sulphur, Tellurium, Tin, Titanium, Vanadium, Zinc, and Zirconium.

Table of Oils, Mineral and other materials prices including items like Oils, Mineral, Paints and Colors, Ozokerite, Pyrites, Quartz, Sal Ammoniac, Salt, Silica, Strontium, Sulphur, Tellurium, Tin, Titanium, Vanadium, Zinc, and Zirconium.

Table of RARE ELEMENTS prices including items like Argon-Spectrum, Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Helium, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rubidium, Rutherfordium, Selenium, Strontium, Tellurium, Thallium, Thorium, Vanadium, Yttrium, and Zirconium.

Table of RARE ELEMENTS prices (continued) including items like Argon-Spectrum, Barium, Beryllium, Boron, Calcium, Cerium, Chromium, Cobalt, Didymium, Erbium, Gallium, Germanium, Glucinum, Helium, Indium, Iridium, Lanthanum, Lithium, Molybdenum, Niobium, Osmium, Rhodium, Rubidium, Rutherfordium, Selenium, Strontium, Tellurium, Thallium, Thorium, Vanadium, Yttrium, and Zirconium.

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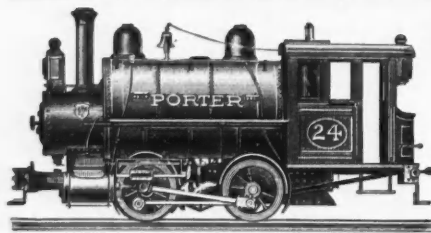
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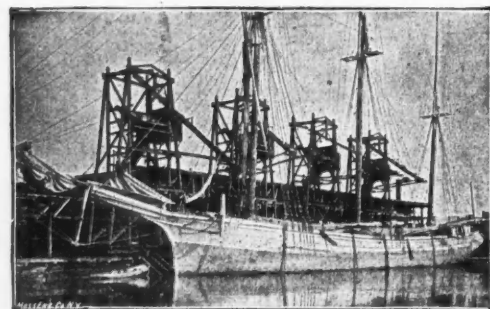


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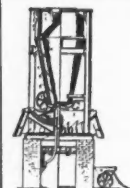
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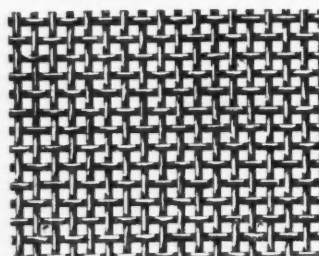
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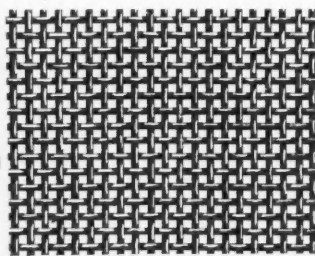
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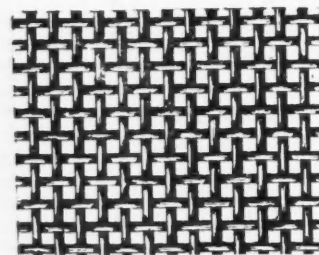


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Copper. American Metal Co. Arizona Copper Co. Atlantic Mining Co. Balbach S. & Ref. Co. Baltimore Cop. Wks. Co. B. H., & Son. Bridgeport Copper Co.

Copper. Phelps, Dodge & Co. Vivian, Younger & Bond. Lead Burners. Vollmer & Beaton. Lead Linings for Chlorination Tubs. Raymond Lead Co. Link Belting. (See Belting.) Link Belt Machinery Co. Lead Machines. General Electric Co. Hunt, C. W., Co. Porter, H. K., & Co. Lubricators. Detroit Lubricator Co. Lunkenheimer Co. Dealers in Mining, Milling and Other Machinery. Allis, Edw. F., & Co. American Diamond Rock Drill Co. Bacon, R. C. Best, Chas. H., & Co. Billin, Chas. E., & Co. Biak, T. A. Bradley Pulverizer Co. Bullock, H. C., Mfg. Co. Caldwell, H. W., & Co. Colorado Iron Works Co. Cunnigham & Co. Denver Eng. Wks. Co. Fairbanks, Morse & Co. Fraser & Chalmers. Gates Iron Works. Gillette-Herzog Mfg. Co. Hammond, Mfg. Co. Hendie & Southoff Mfg. Co. Ingersoll-Sergeant Drill Co. Jeffrey Mfg. Co. Jessop, W., & Sons, Ltd. Lamb-Holting Engine Co. Ligerwood Mfg. Co. Krupp, F. McCull, R. McNeil & Co. Mine & Smelter Supply Co. Manganese Steel. Taylor Iron & Steel Co. Metallurgical Works and Ore Processors. Amr. Zinc Lead Co. Baker & Co. Balbach S. & Ref. Co. Baltimore Cop. Wks. Co. Bridgeport Copper Co. Canadian Copper Co. Colorado Iron Works Co. Con. Kas. City S. & R. Co. Denver Eng. Wks. Co. Elliott's Metal Co., Ltd. Frazer & Chalmers. Mathiessen & Hegeier Zinc Co. Leuzou & Co. Montana Ore Purchasing Co. Orford Copper Co. Pass, C., & Son, Ltd. Phelps, Dodge & Co. Fisher Lead Co. Raymond Lead Co. Spanish-American Iron Co. Stern, Julius & Co. Tod, Wm., & Co. Vulcan Iron Works. Walburn-Swenson Co. Frazer & Chalmers. Mathiessen & Hegeier Zinc Co. Leuzou & Co. Montana Ore Purchasing Co. Orford Copper Co. Pass, C., & Son, Ltd. Phelps, Dodge & Co. Fisher Lead Co. Raymond Lead Co. Spanish-American Iron Co. Stern, Julius & Co. Tod, Wm., & Co. Vulcan Iron Works. Walburn-Swenson Co. Mine Cars. Colorado Iron Works Co. Denver Eng. Wks. Co. Fairbanks, Morse & Co. Hendie & Southoff Mfg. Co. Hunt, C. W., Co. Nelsonville Foundry & Machine Co. (See Machinery.) Mine, Mill and Smelters' Supplies. Cunnigham & Co. Denver Eng. Wks. Co. Gates Iron Works. Roessler & Hasslacher Chemical Co. (See Machinery.) Mining and Land Concessions. American Dev. & Mg. Co. Detroit Copper Mfg. Co. Eureka Co. Isabella Gold Mfg. Co. Rio Pinto Copper Co. Smuggler-Union Mfg. Co. Nickel. Canadian Copper Co. Orford Copper Co. Ore Cars. Colorado Iron Works Co. Gillette & Herzog. Ore Roasters. Brown, Horace & Co. Colorado Iron Works Co. Cummer, F. D., & Sons Co. Dunbar, R., & Son. Ore Testing Works. Colorado Iron Works Co. Hunt, C. W., & Co. Montana Ore Purchasing Co. Ledoux & Co. Packing and Pipe Coverings. Brandt, Randolph. New York Belting & Packing Co., Ltd. Power Specialty Co. Wyckoff & Son, A. Perforated Metals. Robinson, R. Perf. Metal Co. Fraser & Chalmers. Harrington & King Perforating Co. Peroxide of Sodium. Roessler & Hasslacher Chemical Co. Phosphor Bronze. Phosphor-Bronze Smelting Co. Pile Drivers. Bucyrus Steam Shovel and Dredge Co. Ingersoll-Sergeant Drill Co. Pipes. Billin, Chas. E., & Co. Fairbanks, Morse & Co. Fouca, Wm., & Co. Power Specialty Co. Wyckoff, A., & Sons. Plating. Baker & Co. Johnson, Matthey & Co. Plumbing (See Graphite.) Powder. Atlantic Dynamite Co. Ingersoll-Sergeant Drill Co. Puffblasters. American Forge & Foundry Co. Australian Mag. Stand. McNeill's Code. Mining Investor. Mining Journal. Scientific Pub. Co. Denver Republican. El Minerio Mexicano. Indian Engineering. Evans. Billin, Chas. E., & Co. Cameron, A. E., Steam Pump Works. Clayton Air Com. Wks. Co. Smith-Valle Co. Tod, Wm., & Co. Fairbanks, Morse & Co. So. African Mg. Jour. Zeitschrift für Praktische Geologie. Fraser & Chalmers. Jeanesville Iron Wks. Snow Steam Pump Co. Smith-Valle Co. Tod, Wm., & Co. Worthington, H. R. Pyrites. Fuert Bros. & Co. Quarrying Machines. Ingersoll-Sergeant Drill Co. Rand Drill Co. Sullivan Machinery Co. Quicksilver. Sureka Co. Railroads. Atchison, Topeka & Santa Fe Ry. Chicago & N. West. R. R. O. Kas. Quincy, R. R. C. C. C. & St. L. Denver, Leadville & Gunnison Ry. Florence & Cripple Creek R. R. Illinois Central R. R. Midland R. R. of Kentucky. Rio Grande Southern R. R. Southern R. R. U. F. D. & G. R. R. H. C. W., Co. Robinson & Orr. Forster, H. K., & Co. (See Machinery.) Regulators, Dampers, Heat, Etc. Gates Iron Works. Jenkins Bros. Rock Drills. (See Air Compressors.) Roofing. Berlin Iron Bridge Co. Phelps, Dodge & Co. Rubber Ties. New York Belting & Packing Co., Ltd. Scales. Fairbanks, Morse & Co. Sereena. Altonian R. Perf. Metal Co. Colorado Iron Works Co. Denver Eng. Wks. Co. Fraser & Chalmers. Gates Iron Works. Marston Steam Shovel Co. Smelting and Refining Works. Balbach S. & Ref. Co. Baltimore Cop. Wks. Co. Bridgeport Copper Co. Con. Kas. City S. & R. Co. Elliott's Metal Co., Ltd. Gillette-Herzog Mfg. Co. Mathison Smelting Co. State Ore Smelting Co. Sprocket Wheels. Detroit Sprocket Chain Co. Steel Rails, Castings, Rolls, Drill Steel. Bethlehem Iron Co. Crescent Steel Co. Chester Steel Cast. Co. Denver Eng. Wks. Co. Pollock, Wm. B., & Co. Robinson & Orr. Taylor Iron & Steel Co. (See Metal Dealers.) Sulphur Apparatus. White, Edward F. Tanks. Billin, Chas. E., & Co. Colorado Iron Works Co. Denver Eng. Wks. Co. Fairbanks, Morse & Co. Gates Iron Works. Williams Mfg. Co. Telegraph Wires and Cables. Okonite Co., Ltd. Teals. Best, Chas. H., & Co. Pratt & Whitney Co. Tubes. Best, Chas. H., & Co. Pollock, Wm. B., & Co. Williams Bros. Tubing-Rubber. New York Belting and Packing Co., Ltd. Turbine Water-Wheels. American Impulse Wheel Co. Letell, Jas., & Co. Pelton Water Wheel Co. Stillwell-Bierce & Smith-Valle Co. Valves. Eddy Valve Co. Fairbanks, Morse & Co. Jenkins Bros. Lunkenheimer Co. Powell, Wm., & Co. Ventilators. Bullock, H. C., Mfg. Co. Tod, Wm., & Co. Fraser & Chalmers. Voltmeters. Weston Electrical Instrument Co. Violentite Emery Wheels. New York Belting and Packing Co., Ltd. Water-Wheels. American Impulse Wheel Co. Letell, Jas., & Co. Pelton Water Wheel Co. Stillwell-Bierce & Smith-Valle Co. Well Drilling Machinery. Sullivan Machinery Co. Williams Bros. Wharfage. Lambert's Wharfage Co. Wheels, Car. Chester Steel Cast. Co. Taylor Iron & Steel Co. Wire Clips. Robinson, R. Perf. Metal Co. Harrington & King Perforating Co. Tyler, W. S., Wire Works Co. Windmills. Fairbanks, Morse & Co. Wire Ropes and Wires. Phelps, Dodge & Co. R. Biling, J. A. Sons & Co. Ropeway Syndicate. California Wire Wks. Cooper Hewitt & Co. Trenton Iron Co. Hunt, C. W., Co. Wire Rope Tramway. Brown Hoist & Conv. Co. MacLine Co. California Wire Wks. Colorado Iron Works Co. Denver Eng. Wks. Co. Fraser & Chalmers. Hunt, C. W., Co. Brown Hoist & Conv. Co. & Co. Ropeway Syndicate. Roberts Mfg. Co. Vulcan Iron Works. Hunt, C. W., Co.

POSITIONS VACANT

Free Advertising.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1536 WANTED - AN ASSAYER AND Chemist for the City of Mexico; preferably one having had experience in Western smelter practice. Salary \$150 Mexican currency per month. Address, stating age, experience and references, PUENTE, ENGINEERING AND MINING JOURNAL.

1537 WANTED - A MINING ENGINEER experienced in silver mining and graduate of a technical school, to go to Peru; must have best references as to competency and reliability, and good knowledge of Spanish language. Address, stating salary expected, etc., LIMA, ENGINEERING AND MINING JOURNAL.

1538 WANTED - MINING SUPERINTENDENT for coal mines. Must be energetic, reliable, good manager of men and have practical knowledge of the most economic methods and management. Address giving references and stating experience and salary expected, WEST VIRGINIA, ENGINEERING AND MINING JOURNAL.

1539 WANTED - A FIRST-CLASS BITUMINOUS coal mining engineer for mine. Capacity, one to five thousand tons per day; located West Virginia; must be thorough in all branches of the business. Address, with references, JUNO, ENGINEERING AND MINING JOURNAL.

1540 WANTED - A COMPETENT PARTY for the position of General Manager for a first-class bituminous coal company. Capacity of mines, from one to five thousand tons per day; location, West Virginia. Must be able to manage the business and dispose of the product. Address, with references, salary, etc., CYNTHIA, ENGINEERING AND MINING JOURNAL.

1541 WANTED - MAN OF LARGE EXPERIENCE in fine concentration of lead-iron ores carrying gold and silver, with rolls, trommels, jigs and vanners. Must also be thoroughly conversant with stamps and amalgamating plates. To a competent man entire charge of property in the Southwest, making seven tons daily, will be given. Must furnish gilt-edged references. Address CONCENTRATION, ENGINEERING AND MINING JOURNAL.

1542 WANTED - A BRIGHT, ACTIVE young man who has had experience with mathematical instruments, architects' and engineers supplies and drawing instruments, to take charge of that department in a large store in Seattle, Wash. Position vacant and salary fair. Address KLONDYKE, ENGINEERING AND MINING JOURNAL.

1543 WANTED - CONTRACTOR'S FOREMAN on work within 100 miles of New York. One thoroughly experienced and familiar with all the latest methods of working rock drills, blasting and using steam shovels and railroad track work. Send copy of references and state salary required. Address H., ENGINEERING AND MINING JOURNAL.

1544 WANTED - STEAM DRILL REPAIR MAN to take charge of all repairs on fifteen Sergeant drills. Send copy of references and state salary wanted. Address D., ENGINEERING AND MINING JOURNAL.

1545 WANTED - ASSAYER, RAPID AND exact, with about four or five years' experience, a young man preferred, to go at once to British Guiana. Address, with references, etc., E. E. L., ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

A MAN, 27 YEARS OLD, WITH TECHNICAL education, previously assistant chemist at a large smelter and now with a consulting engineer, desires a position in the fall with a milling, smelting or refining company. Good references. Address C. D., ENGINEERING AND MINING JOURNAL. No. 18,067, Oct. 9.

METALLURGIST, SPEAKING ENGLISH, French and German, with wide experience in refining by electrolysis and smelting copper, silver and gold, extraction of gold and silver from tailings and ores, construction of plants therefor and their management, desires position at \$500 per month. C. H. P. 11, ENGINEERING AND MINING JOURNAL. No. 18,068, Sept. 11.

WANTED - POSITION BY GRADUATE engineer, B. E., with university gold medal, 1893; M. C. E., 1895, having held fellowship for two years; knowledge of geology and chemistry; gained geology scholarship at University; five years' engineering and business experience; highest references; age 27. Apply W. H. L., ENGINEERING AND MINING JOURNAL. No. 18,082, Sept. 18.

ELECTRICAL AND STEAM ENGINEER, experienced in the manufacture, erection and repair of every sort of electrical and steam apparatus, wants a permanent position. Correspondence solicited. Address ELECTRICAL, ENGINEERING AND MINING JOURNAL. No. 18,081, Sept. 11.

TO KLONDIKERS! - A PRACTICAL AND theoretical mining engineer, metallurgist and thorough prospector, graduate of Germany and of over 30 years' reputation on the Pacific Coast from Alaska to South America, first pioneer quartz and placer miner and explorer of Alaska from 1877 to 1887, thoroughly acquainted with Yukon and McKenzie rivers and tributary regions, wishes employment either as mining expert and engineer and prospector or to take a party of prospectors into the Yukon country this coming spring. For particulars address YUKON, ENGINEERING AND MINING JOURNAL. No. 18,077, Sept. 25.

WANTED - POSITION BY A THOROUGH Accountant who has had experience in buying and selling ores. Ample business training and unquestionable references. Address P. O. BOX 885, Denver, Colo. No. 18,076, Sept. 25.

CHEMIST, LEHIGH UNIVERSITY GRADUATE, wants position. Lately employed by reduction plant; best references; salary moderate. Address LEHIGH, ENGINEERING AND MINING JOURNAL. No. 18,074, Sept. 25.

CHEMIST - A RECENT GRADUATE OF Lehigh University wishes position. Some experience in assaying. Address J. M., ENGINEERING AND MINING JOURNAL. No. 18,083, Sept. 11.

AGENT - EDUCATED ENGINEER WITH wide acquaintance in iron, steel and mechanical business here and abroad, has experienced business and engineering ability, energy and address, wishes position to represent company in the East or central West. Best references from last 16 continuous years important work. Address EDUCATED, ENGINEERING AND MINING JOURNAL. No. 18,079, Sept. 25.

WANTED - POSITION OR WORK IN ASSAYING by a graduate of Columbian University; references. Address A. B. ADAMS, Takoma Park, D. C. No. 18,086, Sept. 25.

CHEMIST AND ASSAYER - YOUNG MAN, graduate of one of the best schools of chemistry in the country, wants position as chemist or assayer. Can do all kinds of analytical work, and have made particular study of industrial and sanitary chemistry. Best of references furnished. Address A. C. ENGINEERING AND MINING JOURNAL. No. 18,089, Sept. 11.

THE ADVERTISER DESIRES A POSITION as manager or engineer where the Spanish language would be essential. Has had over 20 years' experience in gold and silver mines; is thoroughly competent, a good surveyor and can assay for gold, silver and other metals; member of the American Institute of Mining Engineers and of the Federated Institute of Mining Engineers. Would be willing to examine and report on mines in any part of the world. Excellent references and testimonials. Address CONSULTING ENGINEER, ENGINEERING AND MINING JOURNAL. No. 18,086, Sept. 18.

SUPERINTENDENT OF CHEMICAL works, manufacturing sulphuric, nitric, mixed acids, hydrochloric and minor products, is desirous of change; first-class references. Address MODERN, ENGINEERING AND MINING JOURNAL. No. 18,087, Oct. 2.

\$7,800 GIVEN AWAY TO PERSONS making the greatest number of words out of the phrase "Patent Attorney Wedgerburn." For full particulars write to the National Recorder, Washington, D. C., for sample copy containing same.

CONTRACTS OPEN.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., August 31st, 1897. - Sealed proposals will be received at this office until 2 o'clock p. m. on the 23d day of September, 1897, and opened immediately thereafter, for all the labor and materials and fixing in place complete, the low pressure, return circulation, steam heating and ventilating apparatus required for the U. S. Post Office building at Lynn, Mass., in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Lynn, Mass. Each bid must be accompanied by a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids, and to waive any defect or informality in any bid, should it be deemed in the interest of the government to do so. All proposals received after the time stated for opening will be returned to the bidders. C. E. KEMPER, Acting Supervising Architect. Orig.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., September 7, 1897. - Sealed proposals will be received at this office until 2 o'clock p. m. on the 5th day of October, 1897 (to be then immediately opened), for all the labor and material required to complete the approaches to the U. S. Post Office, Court House and Custom House at St. Paul, Minn., in accordance with the drawings and specification, copies of which may be had at this office or at the office of the Superintendent at St. Paul, Minn. With each bid must be enclosed a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids and to waive any defect or informality in any bid should it be deemed in the interest of the government to do so. All proposals received after the time stated for opening will be returned to the bidders. JAMES P. LOW Acting Supervising Architect. Orig.

SEWERS. - Proposals will be received until 5 o'clock p. m. on Monday, September 13th, 1897, by James J. Bergen, President of the Board of Commissioners of Somerville, N. J., for constructing approximately four miles of sewer at Somerville aforesaid, as follows: 2,575 ft. of 20-in. pipe, 890 ft. of 18-in. pipe, 2,181 ft. of 15-in. pipe, 1,607 ft. of 12-in. pipe, 1,270 ft. of 10-in. pipe, 12,840 ft. of 8-in. pipe, with manholes, flushbanks, inlets and appurtenances. A certified check for \$500, payable to the order of William H. Taylor, treasurer, must accompany each bid as a guarantee of good faith. The Board of Commissioners reserve the right to reject any or all bids. Plans and specifications may be seen at the office of the subscriber, and at the office of Joshua Doughty, Jr., the engineer in charge of the work. The bids will be opened at the meeting of the Board of Commissioners, at 8 o'clock on the evening of the same day, and no bids will be considered unless filed with the subscriber before 5 o'clock.

WATER-WORKS AND SEWER SYSTEMS. - Sealed proposals for the construction of a system of water-works and a system of sewers will be received by the Board of Commissioners of the village of Summerville, Ga., until 12 o'clock m., of Tuesday, September 14th, 1897, and at that time will be publicly opened and read. Each bid to be upon printed forms and to be accompanied by a certified check for five hundred (\$500) dollars, payable to the village of Summerville. The successful bidder to file a bond of five thousand (\$5,000) dollars. The Board of Commissioners reserves the right to reject any or all bids.

CONSTRUCTING Q. M. OFFICE AND SHOPS, Fort Hamilton, N. Y. H. - Sealed proposals, in triplicate, will be received here until 11 o'clock a. m., September 23d, 1897, and then opened, for construction of Administration Building, shops and storehouse, with necessary heating, gas-piping and plumbing. U. S. reserves the right to accept or reject any or all bids or any part thereof. Information furnished on application. Envelopes containing proposals should be marked "Proposals for Public Buildings at Fort Hamilton," and addressed CAPT. J. M. CARSON, JR., A. Q. M.

(Continued on Page 21.)

THE ENGINEERING AND MINING JOURNAL

ADVERTISING RATES. (NONPAREIL MEASUREMENT.)

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SPECIAL POSITIONS.

Front page, double regular rates. Back outside page, 80 per cent. above regular rates. Page facing editorials, 50 per cent. above regular rates. Page facing market reports, 25 per cent. above regular rates. Inside front cover, 50 per cent. above regular rates. Inside back cover, 25 per cent. above regular rates.

LANDS AND MINES FOR SALE.

J. F. CROSETT,
Secretary, Gold Mining Exchange,
No. 628 Sacramento Street, San Francisco, Cal.
GOLD MINES FOR SALE.
On Pacific Coast. Correspondence solicited.

MISSOURI ZINC-LEAD MINES.
Illustrated Description sent free
to any parts of the world.

Address **E. HEDBURG, M. E., Joplin, Mo**

FOR SALE or LEASE.

A Patented Gold Mine near Junction Creek, La Plata
County, Colo. About 340 feet of work on tunnels and
shafts. Shows good ore. Lowest mill run \$29.50 per
ton. Needs reduction works. Can be had for about
one-tenth of price for similar property in a "boomed"
district. For particulars address

GARBANATI & HICKS, Lawyers,
Durango, Colo.

VALUABLE LEAD PROPERTY

For Lease in Southwest Virginia. Will be subdivided
to suit purchasers. Large veins ore within six feet of
surface, running 76% lead and 5% silver per ton. Address
VIRGINIA ENGINEERING AND MINING JOURNAL.

FOR SALE.

A very valuable, extensive Lead Mining Property in
Southwest Virginia. Shafts sunk over 200 ft., and
actual work has demonstrated richness of veins and
purity of ore. Address

GEORGE FRANKE, Baltimore, Md.

COPPER PROPERTY for Sale.

400 ACRES in Southern Virginia, two miles and a
half from railroad depot, with vein of high-grade copper
ore, carrying silver. Shipment of three tons has been
made. Address **COPPER, Box 535, Richmond, Va.**

MORTGAGE SALE.

Under and by virtue of the powers contained in a cer-
tain mortgage made the 6th day of April, 1882, by the
Canada Consolidated Gold Mining Company in
favor of Robert Richardson, of the City of Belleville, as
Trustee, which said mortgage will be produced at the
time of sale, there will be offered for sale by PUBLIC
AUCTION by C. J. Townsend & Co., at No. 22 King
Street West, in the City of Toronto, Ont., on Saturday,
the 18th day of September, 1897, at the hour of 12 o'clock
noon, the following property (including the property
formerly operated by the said company for gold mining
purposes):

1. Lot No. 10 in the 8th Concession of the Township of
Marmora, in the County of Hastings and Province of
Ontario, Can., less five acres thereof, said to belong to
W. J. Gatling.
 2. The west half of Lot No. 10 in the 9th Concession of
the said Township.
 3. The east half of Lot No. 9 in the 8th Concession of
the said Township.
 4. A portion of the northeast quarter of Lot No. 8 in
the 8th Concession of the said Township.
- On the property are two shafts sunk for the purpose
of mining gold-bearing arsenical ore, with drifts and
extensions; a mill building formerly used for treating
the ore; brick office building and commodious brick
residence; a number of workman's cottages and other
buildings and erections used in connection with the
working of the mines.
- For terms and conditions of sale apply to **DEWART
& RANEY, Solicitors** for the present Trustee under the
said mortgage, 26 King Street East, Toronto, Ontario.
Dated the 9th day of July, A. D. 1897.

**MINING PROPERTY
FOR SALE.**

All the property, real and personal, of the

Lac La Belle Mining Company

SITUATED IN KEWEENAW COUNTY, MICH.

Embracing 3,655 acres on the mineral range, 18,768
acres in fee, 1,938 acres surface only, making 20,756 acres
south of mineral range, with the hardwood still stand-
ing, together with seven miles of railroad to stamp
mill at Lac La Belle, with outlet thence to Lake Super-
ior. Plant at the mine and Lake all in good order and
ready for operation. Inquire for further particulars
from

W. R. VIVIAN, Supt.,
Delaware Mine P. O.,
Keweenaw Co., Mich.

**MACHINERY AND SUPPLIES
FOR SALE.**

MACHINERY

FOR SALE—CHEAP FOR CASH.
Hoisting Engines, Air Compressors, Rock Drills,
Rock Crushers, Dump Cars, Channelling Machines,
Steam Pumps, Steam Shovels, Light Locomotives,
etc., all in good condition.

WILLIS SHAW,
506 N. Y. Life Building, CHICAGO.

MISCELLANEOUS WANTS.

SECOND-HAND RAILS.

If you have any Rails which are in good
condition to relay—or if only good to be
used as scrap—write us we buy both
kinds.

ROBINSON & ORR,
No. 419 Wood Street, Pittsburgh, Pa.

**WANTED—A QUANTITY OF 10-LB., 12-LB.
and 16-LB. Second-hand T-Rails in good condi-
tion. Also Splices, Bolts and Spikes. Address**
GOLDEN WAVE MINING CO.,
Congress, Ariz.

WANTED.—FOREMAN AND ASSAYER
for quartz gold mine; first-class references re-
quired. Apply by letter to
L. S. McLURE,
Room 608 Security Building, St. Louis, Mo.

WANTED TO LEASE TAILING DUMPS

At mill, steam or water power. State full particulars.
TALLINGS,
ENGINEERING AND MINING JOURNAL.

CONTRACTS OPEN.

Continued from Page 20.

BRIDGE—Brainerd, Minn.—Sealed proposals
for the repair and reconstruction of the bridge over the
Mississippi River at Laurel street, Brainerd, will be re-
ceived by the Board of County Commissioners at their
office in the County Court House at Brainerd, until the
23d day of September, 1897, at which time they will be
publicly opened and read. The work will comprise two
separate portions as follows: 1st. The superstructure
complete, including three river piers. 2d. The sub-
structure, excepting the three river piers and compris-
ing 28 piers and two abutments, all of stone and con-
crete.

Bids will be received for either one or both of the two
portions as above. The right is reserved to accept any
bid for either one or both of the portions as may be
deemed for the best interests of the County; or, to re-
ject any or all bids.

A properly certified check on some National Bank
and made payable unconditionally, to the order of Joel
Smith, Chairman, must accompany each bid, and be in
an amount equal to Five Hundred Dollars (\$500) for
the first portion, and Three Hundred Dollars (\$300) for
second portion, or Eight Hundred Dollars (\$800) for
both portions.

Proposals must be made upon blank forms furnished
for that purpose.
Plans and specifications are on file and can be seen,
and blank forms of proposal obtained, after September
13th, at the office of the County Auditor, and also C. F.
LOWETH, Civil Engineer, 94 E. 4th St., St. Paul,
Minn.

**DREDGING.—U. S. Engineer Office, 601 18th
Street, N. W., Washington, D. C.—**Sealed prop-
osals for dredging and rock excavation in Rappahannock River,
Va., and dredging in Urbanna Creek, Va.; also for
dredging in Mattaponi and Pamunkey rivers, Va., will
be received here until 12 M., September 25th,
1897, and then publicly opened. Information furnished
on application. **CHAS. J. ALLEN, Lieut.-Col., Engrs'**

**BRONZE CASTINGS.—U. S. Engineer Office,
Montgomery, Ala.—**Sealed proposals for furnishing
and delivering cement, broken stone, pebbles, fertile
earth, steel I-beams, steel bolts, trolleys and rails,
plumbing supplies, bronze castings, and electric light-
ing plant, at U. S. Engineer Wharf, Fort Pickens, Pen-
sacola Harbor, Fla., will be received here until 12 m.
(noon), September 22d, 1897, and then publicly opened.
Information furnished on application to Lieut. J. P.
JERVEY, Engineers, U. S. A., Warrington, Fla., or to
F. A. MAHAN, Mayor Engrs.

DIVIDENDS.

ISABELLA GOLD MINING COMPANY.
COLORADO SPRINGS, COLO., June 10, 1897.
DIVIDEND NO. 11.
A dividend of ONE-HALF CENT PER SHARE
(\$11,250) has been declared, payable June 25th, 1897, to
stockholders of record June 15th, 1897.
The stock transfer books will be closed June 15th,
1897, at 3 o'clock p. m., and will be reopened on the
morning of June 26th, 1897.
PERCY HAGERMAN,
Vice-President and Treasurer.

S **MUGGLER-UNION MINING CO.,**
804 Boston Building, Denver Colo.
Mines at Telluride, San Miguel Co., Colorado.
DIRECTORS:
J. A. Porter, President; Richard Pearce, V. Pres.;
James B. Grant, A. Eilers, Wm. A. Bell,
Wm. D. Bishop, Jr.,
A. H. Fowler, Sec'y & Treas.

**U. S. ENGINEER OFFICE, 39 Whitehall Street,
New York.** Dredge.—Sealed proposals for purchase of
1 dredge, 3 scows, 2 tugs and equipment, belonging to
the government and pertaining to improvement of
Raritan River, N. J., will be received here until 12
o'clock noon, September 16th, 1897, and then publicly
opened. Information furnished on application. **H. M.
ADAMS, Major, Engrs.**

ELECTRIC LIGHTING.—Ironton, O.—Sealed
proposals will be received by the Clerk of the city of
Ironton, O., until September 16th, 1897, for lighting said
city for a period of 5 or 10 years, as follows: With 100 or
more 1,200-c. p. arc lamps. With 100 or more 2,000-c. p.
arc lamps. With 400 (more and less) 25 and 50-c. p.
incandescent electric lamps. With 400 (more or less) in-
candescent gas lamps. All bids to be made on Phila-
delphia and all-night schedules. Certified check for
\$500 must accompany bid. For further information ad-
dress the City Clerk.

WATER-WORKS.—Renovo, Pa.—Sealed prop-
osals are invited for the material and labor for the
construction of an extension to the Renovo Water-
Works into Drury's Run. The plans and specifications
may be seen on application at the store of Beckman &
Company, Erie avenue, until September 15th, 1897. The
to reject any or all bids is reserved. Included in the right
estimate of material required are 15,216 ft. of cast-iron
pipe, according to specifications; 20,000 lbs. of lead; 800
lbs. of hemp; one 18-in. sluice gate; three gates, one
each of 8 in., 10 in. and 12 in.; labor, 15,200 ft. of
ditching and back filling; 15,200 ft. of pipe laying; setting three
gates and four fire hydrants. **J. H. BAIRD, W. J.
STRALEY, FRED. KERBY, Water Commissioners.**

ELECTRIC LIGHTING.—Sealed proposals will
be received at the office of the Board of Public Works,
in Louisville, Ky., until 12 o'clock noon of September
14th, 1897, for the public electric lighting of the city of
Louisville, Ky. Separate bids are asked for lighting
the city for each term of 5, 7, 10, 15 and 20 years, as the
bidder may select, based on a minimum of the 1,320
2,000-c. p. lamps, as at the present time, and which are
to be increased as required by the city. Proposals must
be made per lamp, lamps to burn 3,900 hours per year.
A certified check for \$1,000 on a Louisville bank must
be deposited with the City Treasurer, and his receipt
for the same must accompany each bid to insure execu-
tion of contract. Blank proposals to be furnished by
the Board of Public Works. The full name and residence
of all the bidders, as well as their security, must be
signed to all proposals. The Board of Public Works
reserves the right to reject any or all bids and readvert-
ise for new.

CAST-IRON PIPE, New Britain, Conn.—Sealed
proposals for furnishing about 12 miles of 20-in. cast-
iron water pipes and appurtenant special castings will
be received by the City of New Britain, Conn., until
September 16th, 1897. Specifications and form of pro-
posal may be obtained at the office of the Board of
Water Commissioners, 86 West Main street, New
Britain, and all proposals must be formally made on
blanks prepared therefor. A certified check for two
thousand dollars (\$2,000) must accompany proposal, and
a bond acceptable to the Water Board, in the sum of
twenty thousand dollars (\$20,000) will be required with
the contract. The Board of Water Commissioners re-
serves the right to reject any or all proposals or to
accept any proposal should the Board deem it for the
interests of the City of New Britain so to do.

WATER-WORKS.—Soldiers Grove, Wis.—The
village of Soldiers Grove, Wis., will receive at the office
of the Village President, until the 23d day of Septem-
ber, A. D., 1897, sealed proposals for the furnishing of
all material and the doing of all work necessary to the
completion of a system of water-works in the village of
Soldiers Grove, which shall conform to the specifica-
tions and accompanying plans. Plans and specifica-
tions may be seen and all information obtained relative
to the work at the office of the Village President, or the
office of Fairbanks, Morse & Co., corner Franklin and
Monroe Streets, Chicago, Ill.

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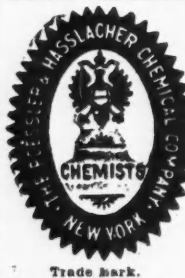
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