

The Engineering and Mining Journal

WITH WHICH IS CONSOLIDATED "MINING AND METALLURGY."

Vol. LXXIV.

NEW YORK, SATURDAY, August 30, 1902.

No. 9.

THE ENGINEERING AND MINING JOURNAL

(Incorporated.)

261 BROADWAY, NEW YORK.

TELEPHONE. 6866 CORTLANDT. P. O. Box, 1833.
CABLE ADDRESS "ENGMINJOUR" N. Y.

W. J. JOHNSTON, President. F. J. PRATT, Treasurer.

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LONDON, ENG.	20 Bucklersbury, 368

DAVID T. DAY, PH.D.	Editor in Chief
EDWARD W. PARKER	Managing Editor
FREDERICK HOBART	Associate Editor
ROSSITER W. RAYMOND, PH.D., M.E.	Special Contributor

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Single Copies, 15 Cents.
United States, Canada, Mexico, yearly, 52 copies, in advance, \$5.00
Other countries in Postal Union, \$7.00
By Bank Draft, P. O. Order or Express on N. Y.
English Subscriptions Payable at London Office, £1 8s 9d

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CURRENT REPORTS as to the purchase of large interests in Calumet & Hecla stock by the Amalgamated Copper Company seem to be intended chiefly for effect on prices on the Stock Exchange. The buying of large blocks of the stock referred to would hardly be possible, while the quantity of floating stock which could be picked up in the open market is too small to be considered. Upon the whole it may be considered that these rumors are chiefly the product of a certain Boston factory, whose output is only for the credulous.

THE MEETING of the Lake Superior Mining Institute in Duluth, an account of which is given on another page, was a very successful one, both as to attendance and the quality and importance of the papers and discussions. The Institute is an active and wide-awake body, and its membership includes managers and engineers engaged upon some of the most important mining operations in the country. Its proceedings at this meeting were fully up to the standard of previous meetings and were full of interest. We hope shortly to present abstracts of a number of the papers read at the meeting.

THE OLD contest over the location of mining claims under other than the mining laws has come up in a new form in California, where the miners of Siskiyou County complain that locations are being made by claimants under the Timber Act of 1878 on territory which should be classed as mineral land. This, it is said, has been more or less the case all throughout northern California and the miners there are having the same trouble as the oil prospectors in the southern part of the State, to which reference is made in another column. The matter is to be brought before the General Land Office and probably the State Miners' Association will have something to say about it at its annual meeting.

IN THE ARTICLE headed "Peace in South Africa," in our issue of June 7 last, we quoted figures as to the division of mining expenses on the Witwatersrand as from Mr. John Hays Hammond's paper on "Gold Mining in the Transvaal." We find on investigation—our attention having been called to the matter—that the figures in question were really taken from Mr. Thomas H. Leggett's criticism of that paper. The table was embodied in the amended edition of Mr. Hammond's paper, and was covered in that by a general acknowledgment, but in quoting it we were misled by the absence of a specific reference in the table itself. We make this correction, as we are desirous of giving full credit to both Mr. Leggett and Mr. Hammond for the admirable work they have done in giving full information on mining conditions in the Transvaal.

APPARENTLY the first concerted attempt has been made to regulate the production of oil in California and to reduce it to correspond with the demand. The Associated Oil Company, with which a large number of producers are connected, has given instructions to close down altogether or to reduce partially the production of the wells which it controls in Ventura and other counties. This order will affect over 50 producing companies which are in the combination, and will have an important effect on the present output of petroleum. It is stated that the

order has been given after careful consideration of the situation, and there will be general compliance with its terms. The price of crude oil has been very low and producers have been complaining of a lack of profit. It remains to be seen whether the measure will improve the present conditions.

SECRET PROCESSES which extract gold from unexpected sources or in unexpected quantities seem to have an unfailing attraction for miners as well as for the general public. We have seen hundreds of such processes brought out—and disappear—during the years in which the JOURNAL has dealt with mining progress. The last to make its appearance is the "oil of gold," reports concerning which come from Leadville, and which seems to have attracted the attention even of some experienced mining men. The accounts have the old, familiar sound; "it saves a far larger quantity of gold than is shown by the fire assay," etc., etc. Above all, the composition of the wonderful "oil" is a profound secret.

We do not mean to say that no new discoveries are possible, and no one can be more willing to welcome actual improvements in metallurgy. Long experience, however, has taught us to beware of the "secret" process, whatever its origin.

REPORTS of a probable large decrease this year in the production of gold from the Klondike should be accepted with some caution. It is too early yet to speak decidedly, and late shipments may bring up the exports from the country to a higher figure than is now estimated. It must be remembered also that a good deal of work of a permanent and expensive character is now going on in the region, and probably a larger proportion of the gold won will be retained in circulation there than in any previous year.

The Yukon country, in fact, seems to have entered upon a period of transition. The substitution of companies with capital, working on a large scale, for the individual prospector and miner has begun; and the development of quartz claims is also beginning. Such changes are inevitably accompanied by a temporary fall in production, and this may be the case in the Yukon, while the region is far from being played out as a gold producer.

SOME OF OUR daily contemporaries have had a good deal to say about possible imports of Welsh anthracite in case the miners' strike continues. Most of what has been written about such imports is evidently without knowledge. The production of Welsh anthracite is not large, and nearly all of that which is mined is covered by yearly contracts, so that the surplus for export would be very small, no matter what temptations in the way of prices are offered. We referred recently to the shipment of one or two cargoes from Cardiff, but these did not amount to much over 4,000 tons. Probably the whole amount which could be spared from Wales would not be more than a few days' consumption of a single one of our large cities, so that no practical relief could be expected from this source. It is stated, moreover, that the anthracite coal is free from duty. While this is provided by the terms of the law, the fact is that the definition of anthracite as given in the Tariff Act excludes all coal having less than 92 per cent fixed carbon, and under this very restricted rule about all the Welsh anthracite—although it is

anthracite in fact—comes under the head of bituminous coal, so far as import duties are concerned. Coal of that class which goes to the Pacific Coast has, in fact, paid duty ever since the passage of the present law. This, however, would not prevent imports with prices at the present figure, but, as we have said above, the quantity is lacking.



AMERICAN DEMAND IN THE BRITISH IRON TRADE.

The extraordinary consumption of iron and steel in the United States, owing to extensive building and other operations, has put orders in the hands of domestic producers that will keep them busy for months to come. In fact, the demand exceeds the supply, so that numerous orders for early delivery must be filled by purchases in Great Britain or elsewhere. To show the present importance of the iron trade with Great Britain, we give below a table of the principal exports from that country to the United States during the seven months ended July 31, 1902, as compared with the corresponding period last year, in long tons:

	1901.	1902.	Changes.
Pig iron.....	23,394	141,345	I. 117,951
Rails.....	20	9,738	I. 9,718
Steel billets, etc.....	6,435	26,778	I. 20,343
Cast iron.....	1,263	1,758	I. 495
Bar iron.....	3,969	2,590	D. 379
Tin and black plates.....	33,275	41,244	I. 7,969
Totals.....	68,356	223,453	I. 155,097

The increase this year was principally in comparatively raw products—pig iron and steel billets. The United States was the largest foreign customer for British pig iron and tin plates this year, and the second best buyer of steel billets.

Recently some further large sized orders for pig iron, etc., have been placed by American concerns which will make the total British exports of iron and steel to the United States in 1902 the largest in many years. The conditions which have brought this about are only temporary, and the purchases from British iron makers will decline, as demand falls off, or our own productive capacity increases.



CALIFORNIA PETROLEUM MINERS AND "SCRIPPERS."

The California Petroleum Miners' Association has determined to make a strong effort to defeat the bill introduced in Congress by Representative Dick, of Ohio, the purpose of which is to reopen the contest between holders of forest reserve scrip and the oil miners in Kern County. Much of this scrip was floated over lands already held by men who were prospecting them for oil. Before the oil discoveries the lands in the San Joaquin Valley were practically worthless, and were classed as agricultural. In the contest before the Land Office the principle was established that the occupation of the land, even though classed as agricultural, by miners prospecting for mineral oils, although the mineral character was undetermined, removed it from the vacant Government land on which alone agricultural pre-emption could be made. The Dick bill will let the defeated "scrippers" go before the Court of Appeals of the District of Columbia for a rehearing. Of course if the "scrippers" could make their point they could get possession of the oil lands instead of the original locators. Some of these lands not worth 25 cents an acre a few years ago are now valuable, since oil has been found upon them or near by in the same belt. The California Petroleum Miners' Association held a meeting in San Francisco on August 18 and considered the whole subject. Senator George C. Perkins made a statement concerning the Dick bill which is the measure endorsed by the "scrippers," and which has passed the House, and is before the Senate Judiciary Committee. The appeals permitted by the bill would tie up title to oil lands in the San

Joaquin Valley and embarrass the oil industry of the State in a very serious way. It would involve a new contest over a matter which, it was supposed, had been settled by the Land Office in an equitable way. It may be added that little of this scrip is now in the hands of those whose lands were taken for the forest reserve. Most of it has been bought up by speculators who saw in the oil discoveries an opportunity of making money to which they were not entitled.

The resolutions passed at the meeting above referred to characterize in strong language the inequitable nature of the pending bill. A committee was also appointed to take measures to prevent its passage if possible.



MARKET CONDITIONS.

Iron and Steel.—But very little change is to be reported in this market as far as future business is concerned. There seems to be, however, an increasing pressure for early deliveries and many manufacturers find the volume of business during the last quarter of the year greater than they had anticipated. Pig iron for any delivery before next June is difficult to find here, the Southern furnaces and most of the Northern furnaces being practically out of the market for that time. We have referred elsewhere to imports from Great Britain, and those from Germany have also been large, while orders continue to be placed abroad. Plates and structural steel are also scarce, so that in several cases building operations have had to be postponed or will be carried out with imported material. The difficulty experienced by some of the Western Pennsylvania and Ohio furnaces in getting supplies of coke to the furnaces continues, in consequence of the shortage of cars and motive power on the railroads.

Copper.—The market shows no change, being very quiet, even dull. While consumption continues large, buying is slow, and it is evident that manufacturers' stocks must be low. The report of the statistician for the associated companies given in our market column last week shows that in the seven months ending with July, our production increased 11,818 tons, while exports were 54,848 tons greater than last year. Our supplies for domestic use were approximately 43,000 tons less than a year ago, while consumption has undoubtedly increased.

Other Metals.—The metal market generally continues active. Tin, however, has been somewhat lower in price owing to larger spot supplies. Prices abroad have also been lower, and there has been something like a break in the speculative market in London.

Lead continues without change and in fair demand. A reported closing down of the mines in Idaho has been contradicted, although accounts are somewhat conflicting.

Spelter continues in strong demand from consumers, and there has been some scarcity of spot metal. In fact, the present supply seems to be inadequate to meet the demand, and smelters are pushed for deliveries.

Coal.—The Western coal market seems to be in good condition, so far as the supply of the larger cities is concerned. The dealers in those cities laid in heavy supplies some time ago in anticipation of a possible strike and are therefore not so much affected by transportation conditions. The Lake coal trade, however, is in very bad condition, and shippers are not putting in anything like the coal which they need. Here again the railroads seem to be unable to supply cars or motive power to move the coal. The supplies of the Northwest are already short, and many dealers believe it will be impossible to move sufficient coal by lake to meet the demands before

navigation closes. The worst of the situation is that there seems to be little prospect of betterment at the lake ports.

The seaboard bituminous coal trade is still more or less affected by the anthracite strike, the demand in the larger cities being heavier, as the stock of hard coal is practically exhausted.

The conditions in the anthracite strike are practically unchanged. There has been a great deal of talk about resuming operations, but it has been talk only, and no practical measures have been taken towards the termination of the strike on either side.



THE "MATCHLESS" MITCHELL.

There is somewhat too much eulogizing of Mr. Mitchell's moderation and ability as a leader. Bishop Potter, returning from a trip abroad, declares himself not posted to date as to the anthracite strike; but one thing he will and can testify, namely, his admiration for Mr. Mitchell.

Before we can heartily praise Mr. Mitchell's moderation, we would like to know more about his connection with the proceedings of his National Mine Workers' Union in Kentucky, where non-union miners were besieged, attacked and killed in its name.

Hon. Abram S. Hewitt, in his admirable talk on the anthracite strike and its leader, points out that Mr. Mitchell's first order, calling out engineers and pumpmen, makes any "moderate" talk about arbitration come with an ill grace from him. The old maxim, "He who demands equity must first do equity," is cited by Mr. Hewitt with crushing force.

But if the pretence of moderation be false, what shall be said of the alleged great ability of this leader? The facts in the case speak more forcibly than the Bishop.

1. Mr. Mitchell personally urged the anthracite mine-workers not to strike; but they did strike. They ordered him to go ahead, and he went ahead; but that was simply to escape from being run over. A cow galloping on the track is not exactly "leading" the locomotive.

2. Having taken "command," he "ordered out" the engineers, pumpmen, etc., in order to drown the collieries. But only a part of the army thus mobilized marched at his orders. The best leaders know that they will be obeyed; the second-best know when they will not be obeyed, and avoid the test; it is only weak leaders, self-misled, who shout peremptory commands to imaginary loyal allies or helpless subjects, and then wait to see what will happen.

3. Mr. Mitchell sought to win public sympathy for his side by a statement of grievances and "intolerable" wrongs. But he failed, because his statement was immediately exposed as not only untrue, but unintelligent. Leaders generally know what they are fighting for. Mr. Mitchell showed himself ignorant of the "intolerable" conditions upon which he had unwillingly declared war. Having done what he was told to do, he apparently said what he was told to say. Does that make him a leader, or a follower?

4. Mr. Mitchell advised his friends to abstain from violence. They scorned his advice, and have perpetrated a series of outrages, ranging from murder down to the scaring of women. They beat to death a citizen whose offence was that he tried to rescue his brother from their hands; and they have dismissed his sister from her position as a school teacher, because her relatives had followed Mr. Mitchell's advice, and obeyed the law. And Mr. Mitchell says the reports are exaggerated, and is happy to believe that his strike is unusually orderly. That is not the way that real leaders deal with insubordination and mutiny.

5. At the Indianapolis convention, having found that the bituminous coal miners would not strike,

Mr. Mitchell urged the delegates from the anthracite region to vote likewise in that sense; but they voted for the universal strike. In other words, the men of whose operations he was in immediate command defied him; the rest commanded, and he obeyed.

6. Mr. Mitchell has aroused the hopes and inspired the persistency of his "followers" in a strike foredoomed to failure, because it had at the outset neither a good cause nor a definite purpose and plan, nor favoring conditions, nor adequate means of support. It was the wrong thing, done at the wrong time, in the wrong way, and by the wrong men. And among the clearest exhibitions of its weakness have been the successive vague and futile prophecies with which its failing flame has been fed.

"The operators would soon offer concessions," but they did not. They had said what they meant, and they adhered to it.

"Mr. Hanna and the Civic Federation would intervene again," but they did not. They had done their best, and failed; and they recognized the impossible.

"President Roosevelt was going to take a hand in the fight, and Col. Wright, as his representative, was going to furnish him the basis for a strenuous interference," but Col. Wright made his investigation and report; the President seems to have found in it no warrant for action of any kind; and the eagerly expectant talk of Mr. Mitchell's friends concerning it has died into a most significant silence.

"The bituminous miners would strike," and so throttle the whole nation in the name of this local contest, but they did not. They would rather take advantage of this opportunity, work extra hours for good pay, by reason of the enforced idleness of their brethren, and promise a part of this surplus gain, to keep the strike going as long as possible.

"But they would send at best half a million a month" to support the 140,000 miners who had found ten times that amount intolerably little; and even this they have not done.

"The furnishing of bituminous coal to anthracite-using communities was to be stopped," so as to make the public suffer somehow; but there is no sign of a lack of bituminous coal anywhere. On the contrary, there are disagreeable proofs of its presence in ample abundance.

"Mr. Morgan was going to straighten things out when he returned from Europe," but Mr. Morgan declines to interfere.

With regard to many of these delusive prophecies, Mr. Mitchell has disclaimed responsibility, in a non-committal, official tone which did not prevent his friends from putting temporary faith in them. Of late, at least, he has confined himself to the general declaration, without particulars, that everything is going well, and victory is sure. This is perhaps the weakest folly of all. For the most incompetent leader is he who does not know when he is beaten. (The popular proverb to the contrary really refers to leaders who do not fancy themselves beaten when they are not.) An actual misunderstanding of the situation is no element of power in leadership.

Mr. Mitchell's one other utterance worthy of notice is his reply to the open letter of the Citizens' Alliance, asking from him an explicit condemnation of the violence daily committed in the name of his cause. The obvious policy of a shrewd leader was to give at once, and with emphasis, the declaration called for. A subordinate of his, president of a local union, saw this chance, and issued a sounding manifesto, saying that his union was opposed to such violations of the law, and would assist in the discovery, arrest and punishment of their perpetrators. Perhaps this announcement was not altogether sincere. Certainly its promise has not yet been fulfilled. The outrages have gone on, and the union officials have done nothing more than to deprecate and dis-

suaude beforehand—not to pursue and punish afterwards. No matter; that was the wise thing to say, anyhow, and when Mr. Mitchell, instead of saying it, put himself openly in the wrong by an insulting refusal, he showed that he was not competent to play the tactical game of correspondence.

In short, no order that this leader has given (except the first strike order, which was practically given over his head) has been obeyed; no promise or prophecy, made by him or in his name, has been fulfilled; no public statement issued by him has stood the test of examination; no measure attempted by him has been successful; and at the present moment, hundreds of privates in the ranks know, better than their nominal leader, the conditions and certain outcome of the struggle.

I notice that he is frequently called a "matchless" leader. In the light of the foregoing analysis of his recent career, I confess, this epithet may be appropriate. I can call to mind other leaders, driven by fate and popular fury beyond their power to control: the leaders of the French Revolution, or the Paris commune, for instance; or Uncle Paul Kruger, or Martin Irons, or Eugene Debs—all of whom, in their day, were extolled for their ability. But for virtuous, well-meaning, sincere, all-round incompetence, perhaps Mr. John Mitchell fairly deserves to be crowned as "matchless."

R. W. RAYMOND.

LAKE SUPERIOR MINING INSTITUTE.

[SPECIAL CORRESPONDENCE.]

DULUTH, MINN., Aug. 23, 1902.

The eighth annual meeting of the Lake Superior Mining Institute which closed with the return of the delegates to this city yesterday afternoon, after a two days' excursion to the iron ranges, was without doubt the most successful, from a business standpoint, and the most enjoyable one generally that has been held since the organization of the Institute. After the informal reception which was held at the Kitchi Gammi Club, Tuesday evening the members and guests repaired to the two special trains that were in waiting, and at half past two o'clock Wednesday morning started for the Stevenson Mine. The two trains in which the excursions were made were models of luxury and comfort. The first train was composed of half a dozen private cars each of which had its dining arrangements. The second train was composed of Pullman sleepers with two dining cars which provided ample and excellent service. The management throughout was about as perfect as could be secured, every possible wish having been seemingly foreseen and provided for.

The Stevenson Mine was reached at a rather early hour (6.30 A. M.), but as time was a factor if the programme was to be carried out, an early start was necessary. Two hours were occupied at Stevenson and at 8.30 the trains pulled out for Mahoning, which place was reached an hour later. Visits were paid to the Mahoning, Hull, Rust and Penobscot mines, a number of visitors going below ground at Penobscot. The trains were retaken at Hibbing, to which point they had been moved while the mines were being inspected. Leaving Hibbing at noon, the party arrived at Mountain Iron at one o'clock, where an hour was spent in watching the interesting open-cut work and steam-shovel mining practised at that place and where iron ore is mined and loaded into 15-ton cars at the rate of one car in less than 2 minutes. Mountain Iron was left at two o'clock and Eveleth reached an hour later, the remainder of the day being occupied in visiting the Adams, Spruce, and Fayal mines. Opportunities were afforded those who desired to do so to go under ground at the Adams and Fayal mines, the underground parties being conducted respectively by Mr. John H. Hearing and Mr. R. R. Trezona. During the afternoon the special trains were transferred to the tracks of the Duluth and Iron Range Railroad. A meeting of the Institute was held in Vail Hall

at Eveleth at eight o'clock in the evening and the night was spent on the train. On Thursday morning, at 7.30 the trains started for Biwabik, which point was reached at eight o'clock. Two hours were spent here in the inspection of the Biwabik and Duluth mines, and at ten o'clock the party left for Ely. At Ely the trains were moved directly to the Savoy Mine and the afternoon was well occupied in visiting this and the Sibley, Zenith, Pioneer, and Chandler mines, the trains being taken again at Ely. Parties were conducted through the Pioneer and Chandler mines by Messrs. John Pengilly and Charles Trezona. Ely was left at six o'clock and Soudan reached at seven. The concluding meeting was held at Soudan in the Finnish Temperance Hall at eight o'clock.

The election of officers for the ensuing year resulted in the choice of Mr. Walter Fitch, Manager Champion Mine, president; Mr. Geo. H. Abeel, treasurer, (reelected); and Mr. A. J. Youngbluth, secretary, (reelected). Messrs. H. T. Elard, superintendent Ashland Mine, W. H. Johnson, manager Oliver Iron Company, at Ishpeming, and Fred. Smith, agent Mohawk and Wolverine Mines were elected vice presidents, and Messrs. Graham Polk, Ishpeming, T. F. Cole, Duluth, and Enoch Shepard, manager, Corrigan McKinney and Co., were chosen managers. These gentlemen with the hold-over vice-presidents and managers constitute the council.

Prof. C. R. Van Hise was elected an honorary member in recognition of his great work on the iron ranges.

While all of the members of the Duluth and the iron ranges deserve much credit for the work they did in looking after the entertainment and pleasure of the visitors, special mention must be made of the services rendered by Mr. W. J. Olcott, the retiring president, and Mr. T. F. Cole, general manager of the Oliver Iron Mining Company, who worked like Trojans, even outdoing the excellent services performed by their associates.

Among those registered at the headquarters during the meeting were the following: G. H. Abeel, Gogebic; G. A. Anderson, Menominee; William R. Appleby, Minneapolis; Edwin Ball, Menominee; Willard Bayliss, Gogebic; T. H. Haller, Marquette; E. D. Brigham, Chicago; E. F. Brown, Menominee; George A. Van Dyke, Menominee; Dr. Barrie, Washington; Thomas Carmichael, Marquette; J. Parke Channing, New York; James Clancy, Marquette; Thomas F. Cole, Duluth; Alfred Collick, Marquette; Abram B. Conover, Chicago; George E. Bailey, Chicago; James B. Cooper, Copper country; E. H. Cutler, J. H. Crane, S. R. Elliott, A. C. Davidson, Menominee, T. W. Denton; Copper country; Frank Drake, Duluth; Murray M. Duncan, Marquette; H. F. Elard, Gogebic; A. T. Findley, Cleveland; James Fisher, Jr., Walter Fitch, Marquette; A. S. Flewelling, Menominee; W. F. Fitch, Marquette; N. P. Flodin, A. C. Braastad, Howard Greer, Jr., Marquette; L. M. Hardenburgh, Gogebic; V. S. Hillger, E. W. Hopkins, Menominee; J. H. Hoff, L. S. Hubbard, copper country; C. H. Hartley, Kaukauna, Wis.; N. P. Hulst, Duluth; Harry Hulst, Marquette; H. S. Haselton, Cleveland; A. F. Harvey, Duluth; George L. Heath, J. F. Jackson, copper country; C. C. Jones, J. C. Jopling, Marquette; B. W. Jones, Menominee; W. H. Johnson, Marquette; O. W. Johnston, William Kelley, Menominee; J. F. Ware, G. F. Knapp, Cleveland; J. W. Kreitter, Duluth; Thomas F. Lynch, Chicago; C. W. Melcher, Prof. C. K. Leith, Madison; I. L. Luxmore, Menominee; John Luxmere, Gogebic; N. O. Lawton, William P. Mars, Duluth; George Desch, L. L. Prescott, H. L. Prescott, W. G. Mather, Cleveland; Franklin Moeller, Akron, Ohio; C. S. Moore, M. B. McGee, Menominee; P. O'Brien, W. E. McKee, Marquette; J. M. Sherrerd, New Jersey; J. H. McLean, Gogebic; Professor F. W. McNair, copper country; E. D. McNeil, Menominee; W. A. McGonagle, Duluth; S. Mitchell, Marquette; W. G. Monroe, Menominee; Hon. Page Morris, Duluth; C. H. Munger, Duluth; George A. Newett, Menominee; R. C. Norton, Menominee; W. J. Olcott, Duluth; Thomas Owens, Duluth; J. H.

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A NEW CHANGING-HOUSE AT WEST VULCAN MINE.*

By WILLIAM KELLY, E. M., VULCAN, MICH.

The changing-house at West Vulcan was designed with special reference to cleanliness, ventilation and the prevention of stealing.

Individual lockers were considered the best means to prevent stealing, and as some of the underground clothes are wet, provision had to be made for drying them. Boots should not be placed in heated lockers, and it does not seem right to ask men to hang their street clothes in dirty lockers, so it was decided to provide each man with two lockers, a cool one for boots and street clothes and a heated one for mine clothes.

To secure cleanliness, the principal requirements are a cement floor, which can be washed with a hose, and screens for the bottoms of the lockers.

The simple way to heat lockers open at the bottom was to run steam pipes under them. By closing the tops of the lockers, the warm, ascending air is led into ducts passing through the roof, and ventilating currents are thus produced. The replenishment of pure air comes through windows and doors, some of which are kept open all the time. While a fan system of ventilation would undoubtedly be more effective than this "natural system," the latter has proved to be sufficient to carry away quite successfully the bad odor characteristic of such buildings.

A common arrangement is to have lockers along the sides of the room with washing troughs through the center, but men washing to the waist splash a good deal and disturb those who are dressing. For this reason a separate room for washing was provided. This is in a wing at the back, 30 by 20 feet with 10 feet studding. A wooden trough 14 inches wide, 4 inches deep, 18 inches from the floor, runs all around the room except across the entrance way. There are pipes for hot and cold water with numerous faucets. The men supply their own basins or pails which they keep in their lockers. A great many prefer to put their pails on the floor when they wash and then can spill and splash without inconveniencing others. There are eleven windows 5 feet from the floor and one in the gable so that there is an abundance of light and a man is below the line of vision from outside.

In the main room there are six hundred and eight lockers, accommodating three hundred and four men. They are 17 inches wide by 11 inches deep inside and 5 feet high. This is ample room for the street clothes, but for the mine clothes a depth of 14 inches or 15 inches would be better. Plank seats 12 inches wide run along the fronts of the cool

lockers, approximately 18 inches from the floor. This is also the level of the bottom of the lockers. The bottoms, except of those against the wall, are of wire netting, which is also used to cover the tops. Wood slats form the bottom of the wall lockers and these lockers are covered with boards inclined at an angle of 45°. The lockers are built of shiplap dressed on both sides. Several plans of arranging the lockers were considered but the one most economical of space is to have the entrance on the side of the building with a passage way or hall across it to the wash room, and to place the lockers in rows lengthways of the building. The aisles between the lockers are 5 feet wide. This gives only 15 square feet to each man to dress in if all of one shift dress together. Practically, however, this does not occur. Still, the aisles are not wider than necessary for men to pass. As there is no interior lining to the building, the studding were put in of dressed lumber 18 inches between centers and form part of the divisions between the wall lockers. A building 32 feet wide admits of the following arrangement as shown in the cross-section: A row of wall lockers for street clothes, with seats; aisle, double row of heated lockers; second aisle; double row of street clothes lockers, with seats; third aisle; second double row of heated lockers; fourth aisle and a row of street clothes lockers, with seats, against the wall again. This makes eight rows of thirty-eight lockers on each side of the hall, and with hall 8½ feet wide, requires a building 124 feet long.

A 2-inch galvanized water pipe was laid about five feet below the floor line under the main hall to the wash room, with branches to each end of the main building and to the small rooms beside the entrance. One length of 2-inch hose is attached to the pipe at one side of the hall. A 5-inch galvanized drain pipe with 2½ inch branches was also laid with the following openings in the floor: One in the center of the wash room, one in the center of each end of the main room and one in each of the rooms on either side of the entrance. The drain pipe has a trap near the discharge end made of 45° ells and nipples to keep the cold air out and prevent freezing.

The building has a stone foundation and after the water and drain pipes were laid, the space between the walls was filled to within 6 inches of the floor line with fine rock from a waste dump near by. The building was then constructed with all the interior wood work before the cement floor was laid. The walls of the building consist of shiplap dressed on both sides, heavy tarred paper and siding. Studding 12 feet high admits of windows above the lockers in the main room. There are sixteen on each side and one over the front door. There are also nine in each end. The top ones are principally for ventilation and are arranged to open with a cord. The bottom row is only 2 feet from the floor and gives emergency exits from each aisle in case of fire. The rafters are 2 by 6 inches covered with shiplap, paper and shingles. The lockers, the walls of the wash room below the windows and the two small rooms at the entrance were painted drab with cold water paint and the upper part of the building white. The large number of windows and the white paint make a cheerful interior. The lockers are numbered with stencil figures.

The small room at the right of the entrance was intended for the bosses' changing room, but it was not finished in time, and the large room proved to be so comfortable, that the former is used as a lunch room by the few men who eat in the building. The room on the left is entered only from the outside and has a window into the main hall. In it are kept the balls of sunshine, which are handed out through the window to each man starting for the shaft. Stretchers, mattresses and blankets are stored in this room.

An electric bell near the front door can be rung from the shaft house. In the winter when a shift is going down, the conductor on the passenger cage, before each trip, rings for the next load of men. The right number go over to the shaft house to be ready when the cage comes up and are exposed as little as possible.

A steam pipe comes in on the left end of the building above what may be called the ceiling joists, rising slightly to the center of the building, which is its high point. It is then distributed across both sides of the hall overhead, with branches downward at each row of lockers and at the small rooms back and front. Four rows of 1-inch pipe pass under the mine clothes lockers for constant use, and for additional warmth for the room in winter there are two rows under each seat in the main room and around the walls of the other rooms. All these pipes drain from the center to the ends of the building into traps, which throw the condensed water up into a 12-inch pipe laid on the ceiling joists. This serves as a storage tank and from it the hot soft water is distributed to the troughs in the wash room and to the other small room. All the steam pipes are laid on iron brackets so as not to come in contact with wood. There is a pressure regulator in the machine shop from which the main heating pipe comes. Last winter a pressure of 35 pounds was carried, but this summer it was reduced to 15 pounds.

As before indicated, the double rows of heated lockers are closed in on top, the covers rising as shown on the longitudinal section, to two ventilators each 2 feet square. The opposite ventilators from the two parallel rows are inclined to each other until they meet and unite in a box 3 feet square, which passes up through the roof.

AMERICAN LOCOMOTIVES IN ENGLAND.

—The American engines now running on the Midland Railway in England are giving entire satisfaction. They are said to be harder on repairs and in the consumption of fuel, but they have the ability to draw loads and make time.

BRITISH IRON AND STEEL EXPORTS.—

The exports of iron and steel, including machinery, from Great Britain for the 7 months ended July 31 are valued as below by the Board of Trade returns:

	1901.	1902.	Changes.
Iron and steel....	£14,998,582	£16,193,585	I. £1,195,003
Machinery	10,620,394	10,926,476	I. 306,082
New ships	5,471,544	3,557,262	D. 1,914,282
Totals	£31,090,520	£30,677,323	D. £413,197

The decrease this year was due chiefly to the heavy falling off in new ships completed on foreign orders.

BRITISH IRON IMPORTS.—Imports of iron ore into Great Britain for the 7 months ended July 31 were, in long tons:

	1901.	1902.	Changes.
Spain	2,638,949	3,022,248	I. 383,299
Other countries	457,916	643,833	I. 185,917
Totals	3,096,865	3,666,081	I. 569,216

The other countries included Greece, Sweden, Algeria and Newfoundland. Imports of pig iron for the 7 months were 145,214 tons, of which 7,647 tons were from the United States. In the corresponding 7 months last year the imports were 76,150 tons, of which the United States furnished 27,586.

TESTING EFFECTS OF SEAWATER ON CEMENTS.—

With a view to further elucidating the effect of seawater on portland cement concrete, a series of experiments on a very large scale are about to be undertaken by the Prussian Government, in conjunction with a number of prominent cement manufacturers. A number of large concrete blocks, made with cements of different compositions, are to be sunk in the sea off the coast of Sylt Island, and will be examined periodically. At the same time, briquettes of the mortar used, and blocks of the concrete will be immersed in tanks on the land. Some of these tanks will contain fresh and the others salt water. Both tensile and compressive tests of these briquettes and blocks will be made from time to time. The mortars used will be compounded so as to determine whether an addition of slags or strass improves the resistance of a cement to seawater. Both high-limed and low-limed cements are being tried. The experiments are expected to extend over a period of thirty years.

*Read before the eighth annual meeting of the Lake Superior Mining Institute, August, 1902.

FACTS ABOUT THUNDER MOUNTAIN.

By ROBERT BELL.

Thunder Mountain, the center of the great boom district of Central Idaho, is situated in the ruggedest and most inaccessible part of the State, near the southeast corner of Idaho County, and more particularly between the head waters of Monumental Creek and Marble Creek, two large mountain streams, both tributary to the Middle Fork of the Salmon River.

The most interesting feature of this new district

some places weather out in blocks with a prismatic tendency and again form deep talus slopes of thin shelly debris.

There are no narrow cross-cutting or radiating dikes in the district (except in the basalt), no quartz veins, and very little evidence of deep faulting or of secondary mineralization aside from that exhibited by the most recent overflows of soft tuffaceous rock along the lines and centers of eruption.

The topographical features of this great volcanic field are extremely rough and uneven, and there is

ridges, which the trails have to follow, and together with the slide rock produce impediments to travel that are a weariness to the soul.

The age of the Thunder Mountain formation could not be determined without a more extended examination of the district and its surroundings, as there are no limiting horizons of recognized age. Three miles west of the Rainbow Range the rhyolites rest directly on the South Fork granite uplifts, and at White's Pass and Marble Creek Canyon, on the east border of the district, where the writer crossed the contact, the rhyolites again rest directly on the granite of the Middle Fork uplift. These formations probably date from early Tertiary times, but the complementary dikes of basalt and the tuffaceous outbursts and overflows are shown to be very recent.

THE DEWEY MINE.

This property, owned by the Thunder Mountain Gold and Silver Mining and Milling Company, of Pittsburg, Pa., and for which a 100-stamp mill has been purchased and delivered in Idaho, is popularly known as the "Dewey Mine."

The various expert reports on the Dewey Mine, made last summer and fall before the snow came and persistently advertised through the medium of the Idaho State press and even given credence in the official report of the State Mining Inspector, are what the Thunder Mountain boom was based on. They are without exception a biased exaggeration or misconception of the actual conditions.

The principal features of the Dewey Mine are a cone-shaped butte 200 feet high at its highest point above the inclined plane of the gulches formed by sliding ground on each side of it. This butte is shaved down to a narrow point at its western extremity and connected to the main mountain on the east side of the basin by a similar narrow ridge. It



FIG. 1. THUNDER MOUNTAIN AND THE DEWEY BUTTE.

is the unique character of the gold deposits of the Dewey Mine and the enormous development of acidic lavas it contains.

The Thunder Mountain proper is a round top summit 8,700 feet in altitude, occupying a central position in the district and probably an area of depression. It is surrounded at a distance from seven to ten miles by an amphitheater of higher elevations, consisting principally of crater cones and basins and connecting ridges of eruptive material.

The whole district is evidently a basin which has been filled with volcanic matter. It is 25 miles in length north and south by 20 miles wide from east to west, and lies between two north and south anticlinal uplifts of granite, along which the canyons of the Middle and South Fork rivers have been eroded.

The granites are rather coarsely crystalline, gray to rusty brown, and contain white and bronze-colored mica and an excess of orthoclase feldspar. The type rocks of the Thunder Mountain District proper are gray, white, pink and greenish-tinted rhyolites, with the flow structure developed in varying degrees.

They are finely crystalline, felsitic to glassy. The crystals of recognizable size are small pebbles and double-terminated dihexagonal pyramids or quartz, together with small phenocrysts of orthoclase, usually in a fine amorphous ground mass. Distinct crystals of biotite hornblende or augite were entirely wanting over the region examined.

The only variation from these formations are the soft tuffaceous slightly vesicular rhyolites found usually around the crater basins, and some black basaltic lava that occurs in small complementary dikes or bosses, especially in or near the most pronounced centers of eruption.

Analysis of half a dozen samples of the type rocks of the Thunder Mountain district prove that they all contain over 70 per cent silica, which brings them all well within the range of the rhyolites, although some of the greenish-tinted sheets, which run quite high in oxide of alumina, resemble dacite, and some other sheets trachyte.

These formations occur in heavy massive overflows that dip in different directions, as might be expected from the numerous centers of eruption observable throughout the district. They are usually contracted into thin, nearly vertical, slabs, and in



DEWEY MINE, THUNDER MOUNTAIN, IDAHO.

reason to believe that they are as much due to gradual elevation and subsidence as to erosion. The air-line distance from Marble City on Marble Creek to Roosevelt on Monumental Creek, over Thunder Mountain summit, is about four miles, approximately east and west, and shows the following variations of level: Marble City, 5,950 feet; Thunder Mountain summit, 8,700 feet; Roosevelt, 6,100 feet.

The whole country surrounding Thunder Mountain for miles has been fairly well timbered with a goodly growth of black pine, fir and spruce, but with local exceptions most of this timber has been killed by forest fires of probably twelve or fifteen years ago.

This dead timber is strewn in tangled heaps over the ground, especially along the canyon bottoms and

covers a total base area of not to exceed twenty acres.

This butte represents a stratigraphic depth of 300 feet and is built up of alternating beds of tuffaceous, white chalky-looking felsite rock, mixed with sandy, clayey and cherty conglomerates and breccias, all of which are well sprinkled with petrifications and carbonaceous matter.

It occupies a central position in what was apparently an ancient crater basin or depression on the west exposure of Thunder Mountain, with a surface area of probably 200 acres, and about 800 feet vertically below the summit of the mountain. This basin now forms the head of Mule Creek, a small tributary of Monumental Creek, which it enters

through a narrow canyon at Roosevelt, one and three-fourths miles west of the Dewey Mine.

Some narrow remnants of the same conglomerate and sandy sediment, with perfectly horizontal deposal lines, are shown along the northeast rim of the basin and indicate that its whole area was filled with these same sedimentary beds of volcanic debris.

The reports that have been made about the foreign origin of these deposits, as marginal seashore accumulations, or glacial moraines, are in error. There is quite conclusive evidence at hand to show that all the material composing them are purely of local origin and derived entirely and exclusively from the immediate solid, felsitic formations that underly and surround them.

is also thickly timbered with pitch-pine. Around these depressions a marginal bed of vegetable peat soon accumulates, mixed with dead and partly charred logs. A fresh slide of clay ground moves down from above and buries one of these beds, thus forming a thin layer of lignitic material. Another subsidence below allows the two beds thus formed to move together, and a jumbled mass of carbonaceous conglomerates results.

The lowest exposed layer of these sedimentary beds is largely composed of the white, chalky-looking felsite rock that was apparently produced as a fine ooze, and probably rests directly on the hard, fine-grained crystalline rock that forms the bed of the basin. This soft, white, felsite rock contains a good

plateau structure in the immediate vicinity of Thunder Mountain summit were planed down by glacial ice. They are more apt to be the result of lava flows. There are no ice moraines, no gravel terraces to speak of and no placers in the whole district outside of the Dewey property.

Fig. 1, looking east, partly shows the north and south rim of the basin, with the cone-shaped butte in the center and the rounded outline of Thunder Mountain in the background. The butte in this picture seems to have a sub-crater in the front of it, but the depression shown is produced by a comparatively fresh slide.

Fig. 2 gives a closer view of the butte, including the 10-stamp mill and covered tramways

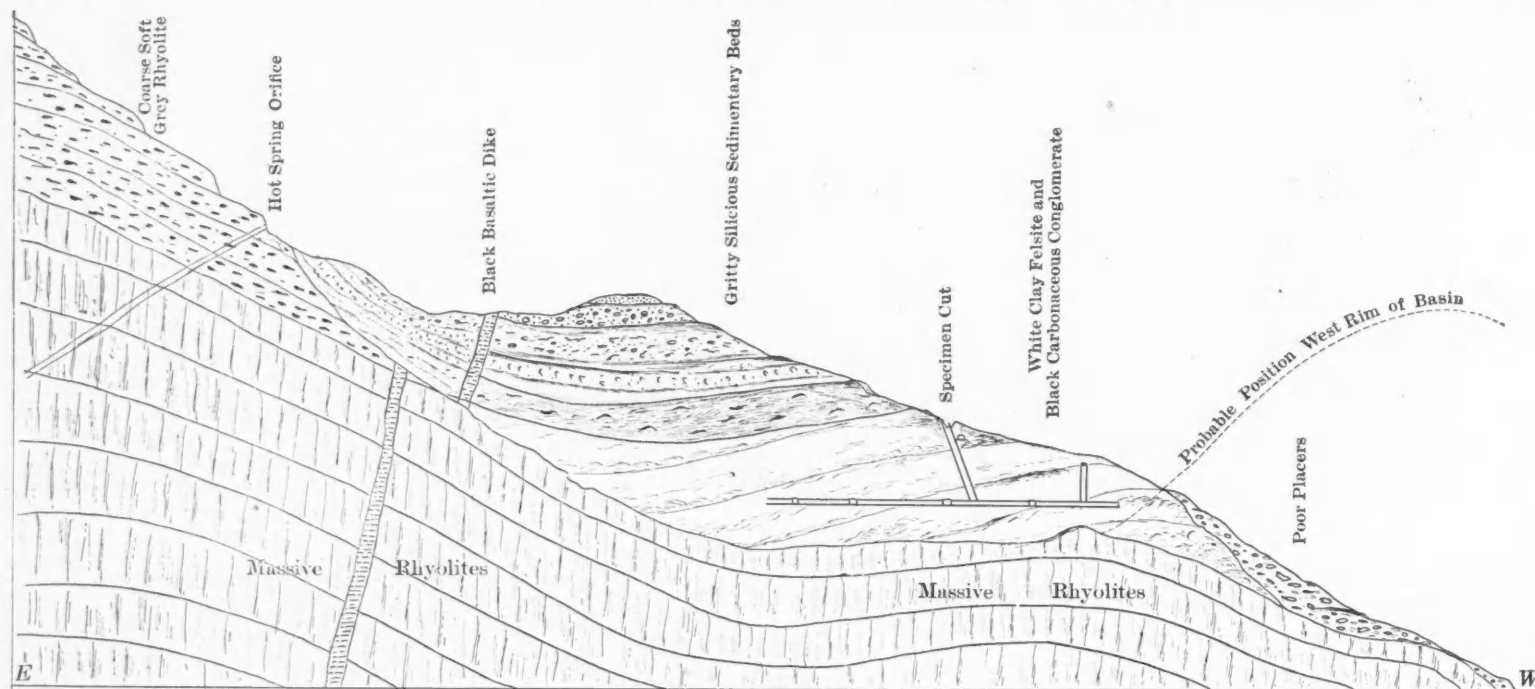


FIG. 3. IDEAL SECTION THROUGH DEWEY BUTTE FROM WEST TO EAST.

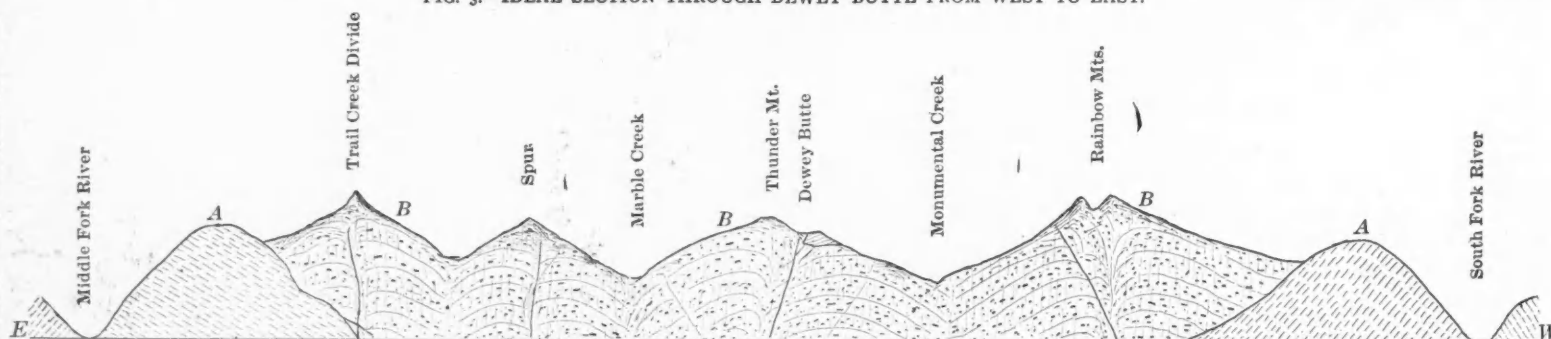


FIG. 4. IDEAL SECTION ACROSS THUNDER MOUNTAIN DISTRICT.

A A Granite. B B B Acidic Volcanic Rocks.

They were evidently produced by more or less violence, mud-geyser action, in a closed basin and probably from numerous vents. The neck of a mammoth hot spring of geyser proportions is still plainly exposed in a brecciated bed of rhyolite on the face of a cliff at the east end of the Gold Bug claim, on the east side of the basin and a little above the level of the top of the butte.

The pebbles in the conglomerate bed contain the same double terminal quartz crystals as the adjacent formation. They were doubtless rounded by attrition in a geyser shaft, and are pronouncedly pitted by the action of hot water. Neither is there any mystery whatever about the charcoal and carbonaceous inclusions contained in these beds. They are constantly forming now, and one of their sources and processes of formation can be plainly observed at the present day.

The basin is full of short north and south fault brakes, that produce narrow runs of sliding ground, that are gradually moving westward and dumping into Mule Creek Canyon.

This disturbance causes numerous little sink-holes, lakes and ponds to dot the surface of the basin, which

percentage of oxide of aluminum, which, assisted by pressure and bed-rock water, has had just the clayey exuding and creeping effect of transporting the superincumbent material when its support was removed by the gradual subsidence of the west rim of the basin.

All these basin sediments, including the Dewey Butte, are gradually moving out and dumping into the Mule Creek Canyon. This great jumbled mass of moving earth, with its tumbling and uprooted pine trees, forms in effect a slow moving avalanche, and the reason why the Dewey Butte has resisted the same complete obliteration of its strata as the rest of the basin-filling is probably from the fact that it is locally petrified in place by the action of the siliceous springs, and may be braced by a projecting knob of solid bed-rock formation.

This moving ground is what was evidently taken for glacial action. It is shown to move on certain lines, especially on the mysterious slide claim, at the rate of 5 feet per annum, and plays havoc with the grade of pipe lines and water ditches cut across it.

There is no definite evidence of ice action in the whole district unless some very limited areas of flat

leading from the entrance of the main tunnel to the mill. The white horizon shown above the mouth of the tunnel and up to the roots of the straight black tree, with short foliage, that is shown on the ridge, directly over the tunnel entrance, is the pay horizon and about 100 feet thick, with a proven base width of 180 feet. The average value of this horizon has been generally estimated at \$6 per ton. This figure, however, is 50 per cent higher than the results obtained by the writer.

The famous 4-foot streak of rich ore that produced such fine specimens is in a cut made obliquely across the ridge between the roots of the straight black tree and the one with thinner foliage just above it. This pay streak contains some knife-blade seams of \$1,000 values, and even better. These values were probably reached from the lean horizons above and precipitated in the crevices of a thin bed of silicified carbonaceous shale that caps the white horizon at this point. The average samples of this rich streak four feet wide assay \$20 per ton.

The main body of the beds above the specimen cut carry a trace of gold but no average pay values. They form an overburden of waste that will double the

cost of mining the white horizon from the point east of the specimen cut. These beds are made up of fine and coarse-grained silts and gritty material, with beds of conglomerate containing rounded pebbles of rhyolite about the size of hen's eggs in a siliceous matrix, and some of them contain inclusions of petrified wood.

Between these beds cherty bands of siliceous precipitate occur, which weather out in thin slabs that ring under the hammer and contain 95 per cent silica. This is the rock that is locally called phonolite, but it bears no more relation to phonolite than does pure quartzite.

The upper beds forming the narrow ridge that connects this butte to the main mountain are composed of soft, unaltered felsite clay sediments that contain two thin bands of brown lignite with the woody structures still preserved. These beds are cut by a nearly vertical dike of black basaltic lava 15 feet thick, that strikes nearly due south across the center of the basin from Nigger Head Peak, which proves the basalt to be of more recent date than the sedimentary beds. Great spongy vesicular boulders of this black lava are strewn over the surface of the basin below the line of its outcrop.

The Dewey Mine is equipped with a 10-stamp mill, which was idle during the time of the writer's visit. It is developed by approximately 1,600 feet of tunnels, drifts and raises. The main tunnel runs south from the entrance on the north side of the butte 180 feet, and from this there is a main drift running east and west each way 250 feet. From these drifts four cross-cuts (so called) have been extended north and south. A raise was put through to the surface from the main tunnel 114 feet, and connects directly with the specimen cut.

The main drift follows approximately under the narrow apex of the ridge that extends west from the butte. The west extension of this drift contains the best values, but will soon connect with the surface if continued, which probably accounts for its enrichment. The values all through the mine seem to be contained in the cracks and crevices, and not in the body of the rock, and are probably the result of percolating mineral solutions subsequent to the formation of the deposit.

The east drift has gained a face depth of about 200 feet. There is no evidence of base mineral at that depth except in a very thin sprinkling of iron pyrites. The work has been done in a very excellent and miner-like manner.

These two main east and west drifts follow a fairly well defined contact, consisting of the white felsite rock on one side and a black carbonaceous conglomerate on the other. This feature has led to the assumption by some that the deposit is a contact fissure vein, but a visit to the north and south cross-cuts, where the nearly horizontal deposal lines are well shown, dispels the theory of a vein.

All the development has been done so far in the lower white horizon, which is proven to a depth of 100 feet. It is likely that this bed will taper to a feather edge within a thousand feet, drifting east, and that the solid crystalline bed-rock formation will be encountered within 100 feet by sinking.

The underlying contact yet to be found may show a line of enrichment. The rich placer values were all confined to the north and south slopes of the narrow ridge west of the specimen cut and not to exceed at the furthest point 300 feet distant.

The accompanying sketch (Fig. 3) will give an idea of the structure of the Dewey Butte and what the result of its further development may prove. The butte seems to have moved in a body for a short distance, which has resulted in a jumble disturbance of the lower white horizon, and has tilted the upper beds slightly to the east, as shown in the photograph.

The Dewey Mine is a geological unit. There is nothing else just like it in the district, but there are some very closely related phenomena.

Except in the Fair View tunnel, 200 feet long, and the Dewey development, there was not a 20-foot hole in the solid formation in the whole district when the writer left there on July 12.

On the east side of Thunder Mountain the Sunnyside Basin is a perfect horseshoe-shaped crater, with a narrow opening to the east, and forms the headwaters of Sunnyside Creek, which enters Marble Creek at Marble City, about 1¼ miles from the Sunnyside Mine.

The floor of this basin is about on a level with the top of the Dewey Butte, is about 50 acres in extent, contains no sediment, and nothing but rounded knobs of the grayish rhyolite base rock of the country.

The walls of this crater are built up of heavy beds of rather coarse-grained granitoid-looking rhyolite, with well-developed phenocrysts of glassy quartz and segregations of soft white felsite in a compact blue ground mass.

The talcy bed planes on joint lines of this formation carry a little free gold, and their disintegration has salted the surface soil in locally favored spots to the extent in some instances of \$3 per ton. Similar conditions are found on Lightning Peak, on the south side of the basin, where the solid formation was also found to carry some values in gold precipitated in thin seams of secondary quartz.

Striking east through the Belle of Thunder Mountain property and across Marble Creek, near Holcomb's camp, and on the opposite slope of the canyon at the head of Slide Creek, there are a number of irregular outbursts of white tuffaceous rhyolite that pan a little free gold at the surface. These formations were evidently effused as rock magma and partly recrystallized on cooling.

A similar line of outbursts and overflows are found south of the Dewey Mine along the Boise trail, and still other similar phenomena are shown along the Rainbow Mountains on the opposite side of Monumental Creek, at the head of Trap, Rainbow and Botha creeks. At the head of the last-named stream the walls of a deep crater basin are colored in alternate bands of white, yellow and red, which suggests the name to Rainbow Mountain.

Thunder Mountain district had a population of about 500 people when the writer left there in July. Probably between 3,000 and 4,000 mining men and prospectors have visited the new district this spring. Most of them soon became dissatisfied with the showing and scattered out into other sections of the State. Lemhi, Custer, and other parts of Idaho County got a large contingent of these, and some intelligent prospecting is now being done in formations of more variety and promise than those of Thunder Mountain proper, and a number of handsome veins of gold, silver, lead and copper, mercury and clean antimony ore have been located.

These large veins found in the district surrounding Thunder Mountain, no matter how base, seem to be quite attractive to, and well worthy of securing with a view of patenting by, mining men from States where transportation facilities are better, for they say it is simply a question of time when these properties will come into market.

The most important discovery that has been made in the Thunder Mountain region since the Dewey Mine is a dike fissure of quartz porphyry 50 feet wide, carrying quicksilver. This dike is contained in a series of quartzose sandstone beds overlying granite. It has been very much altered by solfateric action, and contains a nice sprinkling of cinnabar ore. There is no development of this property yet beyond a few 10-foot holes, but the fissure is well defined for a distance of 3,000 feet, and carries an estimated average value of 1 per cent, or 20 pounds of quicksilver per ton. Large boulders of very much richer ore are found along under the croppings of the vein, and the property has considerable prospective value. It is situated on Sugar Creek, a tributary of the South Fork of the Salmon River, and about 15 miles west of the Dewey Mine.

The ultimate result of the Thunder Mountain boom will probably be beneficial, as it has put a good many capable mining men and prospectors in the State, and there are half a dozen gold-producing counties in Idaho whose offerings of gold property and unprospected territory will discount the Thunder Mountain district, with the added advantage of

being very much more accessible and convenient to get at. This is especially true of other districts in Idaho County. These districts are now being thoroughly investigated, and some very promising discoveries are being made.

A previous article on Thunder Mountain by the writer was written prior to a personal visit to that particular district and was based principally on a knowledge of an adjacent range to the east, between the Middle Fork and the Main Salmon rivers, which contains quite an extensive development of acedid lavas similar to Thunder Mountain, but has an actual bullion record of millions of dollars. The values quoted in that article were taken from reports previously referred to in this.

CHROME IN TURKEY.*

Chrome is found in both European and Asiatic Turkey in considerable quantities, but only districts within easy reach of the sea have been worked. The principal workings are in the neighborhood of Salonica, Broussa and Macri. The largest deposits are said to be in the district of Denislie, but the government has given no permits to work this region. The Denislie ore has yielded in tests as high as 56 per cent per-oxide of chrome, and is a surface deposit. This district has recently been discovered, and is supposed to be a continuation of the Macri chrome stratification. The deposits are some distance from the railroad, and the cost of transport to Chardak, the nearest station on the Smyrna Ottoman Railroad, is close to 36s. (\$8.86). The Broussa mines are comparatively new, and most of their output has gone to the United States. The proprietor of the Broussa mines is Raboug Bey, a functionary in the Sultan's palace. Most of this ore is handled by J. W. Whittall & Co., of Constantinople, who are the agents of Raboug Bey. The Bey has an advantage over his competitors, as he pays no royalty, the mines having been made a present to him by the Sultan.

The Macri district is controlled by Paterson & Co., of Smyrna, who own a number of mines and "permits of research." They also hold mines at Salonica and Broussa.

The government collects a mining royalty of 20 per cent on chrome and a customs duty of 1 per cent. The transportation is usually done by camels. For the Macri ore, transport from the mines to the sea costs from 10s. to 15s. (\$2.43 to \$3.65) per ton. The cost of extraction averages about 6s. (\$1.46) per ton, and shipping expenses, besides customs duty, 1½ (36.5 cents) per ton.

Thus the costs for the Macri ore are:

	S. D.	
Extraction	6 0	= \$1.46
Transport to sea (average).....	13 0	= 3.16
Government royalty	14 0	= 3.40
Customs export duty	0 9	= .18
Shipping expense	1 6	= .365

Cost f. o. b. Macri..... 35 3 = 8.575

It is claimed that the Macri mines are nearly exhausted of their high-grade ore, but there is plenty of low-grade ore testing about 40 per cent of peroxide of chrome. From the Broussa District ore reaches the sea by rail, and this additional expense makes the cost of production about 48s. 3d. (\$11.74) f. o. b. Ismid, the seaport for Broussa.

During the last two years no new mining concessions have been granted, and for the present the Turkish Government only issues shipping permits for 2,000 tons for any new mine, and when this permit has been exhausted a new one must be obtained before the work can be continued. There is a tendency on the part of the government to prevent mining properties from passing into the hands of foreigners. The actual title of any mine in Turkey must rest in the name of a Turkish subject. Mining rights do not go with a piece of land bought for agricultural purposes. The government has, on numerous occasions, disposed of farm land to one person and the mining rights to another. The mining laws have been modified within the last two years, but the new code has not been accepted by the European powers and remains in abeyance.

*From a report to the State Department by R. W. Lane, U. S. Consul at Smyrna.

PRESENT AND FUTURE OF THE AMERICAN GYPSUM INDUSTRY.

By FRANK A. WILDER.

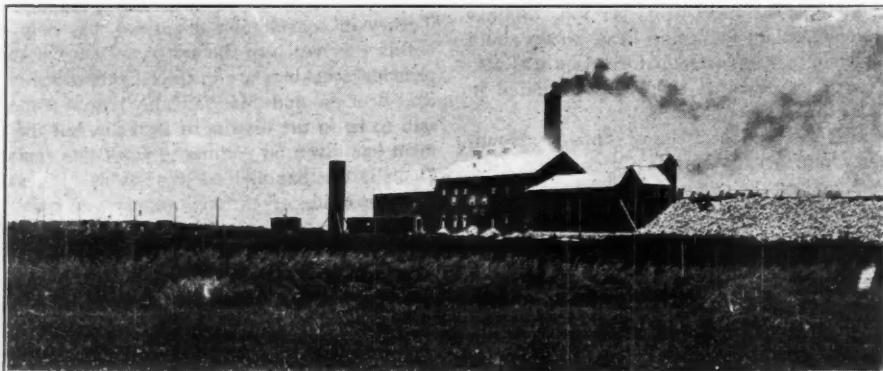
The rapid increase in the value of gypsum products throughout the United States and Europe has aroused a widespread interest in this mineral on the part of those who watch the development of the natural resources of the country. The geological surveys of the several States, where a thorough study of gypsum deposits has been undertaken, are amply justified in their efforts to make plain the value of this form of their mineral wealth. Both geology and chemistry are indebted to Grimsley and Bailey for their investigations in connection with the gypsum deposits of Kansas. A forthcoming report on the gypsum deposits of Iowa will have as a supplement a review of the gypsum and plaster industries of

stone. Practically all of the American gypsum owes its origin to the first cause, certain deposits in New York forming the only possible exception.

From a chemical point of view gypsum is calcium sulphate, and is represented by the formula $\text{Ca SO}_4 + 2\text{H}_2\text{O}$, the water of crystallization amounting to about 21 per cent of the whole. As a building material it owes its chief value to the fact that when heated to 32°F . it loses 14 per cent of its water, forming the hydrate $(\text{CaSO}_4)_2 + \text{H}_2\text{O}$. When finely ground and mixed with water this hydrate, which is better known as plaster of paris, or calcined plaster, assumes again the water that it lost when heated, developing crystals which grow rapidly and interlace so closely that the plaster "sets," or grows hard, expanding somewhat in the process. Gypsum is a soft mineral, easily crushed

Most of the output of American gypsum mills, however, consists of hard wall plasters, and plaster of paris. In their preparation the gypsum is first ground so that 70 per cent will pass a 100-mesh screen, while all passes a 40-mesh. It is then calcined, which is the technical term for the process of driving off from 14 to 18 per cent of the water of crystallization. This is done by methods described later. Gypsum merely ground and calcined constitutes plaster of paris, of which great and steadily increasing quantities are used in the arts. Perhaps the greatest single demand for plaster of paris comes from the makers of glass, for no other substance lends itself so well to the formation of the beds on which plate glass is poured. The yearly consumption of plaster by a large glass factory amounts to thousands of tons. Dental plasters, which are milled to two hundred mesh, form an important part of the output of plaster of paris. Much is consumed in making of crayon, molds, statuary, in wall washes and in surgery.

The great future for gypsum was demonstrated, however, when it was put on the market as a substitute for quicklime for interior walls. Its advance in this field has been phenomenal and a still greater future awaits it. It is superior to lime in many ways and in no respect inferior. A sufficient amount of "retarder" is mixed with the gypsum plaster at the mill, so that it sets slowly and can be handled with perfect convenience. At the mill, also, the hair is added, so that the mixing with sand (two parts sand to one of gypsum plaster), at the time of application, is extremely simple. The walls dry quickly and a room freshly covered with gypsum



AN IOWA GYPSUM MILL.

Germany, where the gypsum industry has been most highly developed.

Gypsum is found in quantities economically important in New York, Virginia, Ohio, Michigan, Iowa, Kansas, Oklahoma, Indian Territory, Texas, South Dakota, Colorado and California, while in many other Western States the mineral occurs abundantly, and will be of economic significance when the growth of the country furnishes a market. The deposits of New York are scattered through Madison, Onondaga, Cayuga, Ontario, Monroe and Genesee counties, and have a thickness varying from 18 inches to 30 feet, while those of Ohio are confined to one small area of 300 acres, near Sandusky. In Michigan gypsum occurs in a broad belt extending from Grand Rapids to Saginaw Bay, but the beds warrant development only at the ends of the belt, at Grand Rapids on the west and at Alabaster, Iosco County, on the east. Two counties in Southwestern Virginia, Smyth and Washington, possess all of the gypsum of that State. The beds are of extraordinary thickness, and cover 20 square miles. Webster County, of which Fort Dodge is the center, holds Iowa's gypsum, where deposits 70 square miles in extent, with an average thickness of 15 feet, occur. In Indian Territory and Texas the gypsum belt is 30 miles wide and 200 miles long. The Kansas gypsum deposit extends from the northern to the southern boundary of the State, in a band 30 miles wide. Canada's gypsum is of significance to the industry in the United States, for most of the mineral quarried there is brought to New York for milling.

Germany's gypsum deposits occur in the Hartz Mountains north of Nordhausen, on the Neckar River near its confluence with the Rhine, and Thuringia near Pörsneck, while the great beds at Montmartre near Paris supply France.

In age the gypsum varies from the Lower Silurian to the Jurassic, much of it occurring with the Silurian, Lower Carboniferous, and Permian formations.

All of the European and American deposits are due to one of two causes: 1. The concentration of water in ancient arms of the sea, by which means the salt which often accompanies gypsum was also deposited. 2. The natural formation of sulphuric acid by the action of water on minerals like pyrite, and the further action of this sulphuric acid on lime-



ROOM IN GYPSUM MINE, FORT DODGE PLASTER COMPANY.

and ground, though it grinds readily only when in a dry state—that is, when free from hygroscopic water. While it forms beautiful monoclinic crystals which may attain a considerable size, the great deposits are generally microcrystalline, appearing dense or finely fibrous to the unaided eye. The Kansas gypsum earths consist of minute gypsum crystals mixed with about 10 per cent of clay, and occur in large deposits readily available for many of the purposes to which gypsum is applied.

The simplest use for gypsum is in the form of a fertilizer, known as land plaster. For this purpose gypsum is simply ground so that it passes a 30 mesh screen. As a fertilizer it possesses great value for certain soils and crops. It makes more porous a heavy clay soil, and at the same time decomposes the double silicates, setting free a soluble potash sulphate which is of great value to the leguminose (which include clover, peas and beans) and other deep rooted plants.

plaster may be safely occupied within a week even though the conditions for drying are not especially favorable. Walls made of gypsum are good non-conductors of heat, and may be thoroughly soaked without breaking from the lath or wire background.

The retarder which is used to render slower the setting of the plaster, commonly consist of a mixture of glue and quicklime, and about 8 pounds added to a ton of gypsum plaster are sufficient to produce the desired effect. The hair, 2 pounds to the ton of plaster, and retarder, are automatically mixed with the gypsum as soon as it is calcined.

In Germany the uses to which gypsum is applied are more numerous than in America. Great quantities are there used by the porcelain factories in making the forms over which the clay is molded. These forms soon lose their sharp edges and must be replaced by new ones, so that the royal pottery at Meisson consumes a hundred tons of plaster of paris daily.

To a limited extent in America, but on a large scale in Germany, gypsum is made into boards, which for walls are nailed or screwed directly to wooden or iron uprights, in which case of course no laths are used. The walls are made either single, or double with an air space between, and are fireproof. The small amounts of excelsior and rushes worked into them to impart toughness and a certain amount of flexibility are in no way inflammable. These boards, made both by hand and machinery, are of all sizes and thicknesses. When used for an exterior covering they are protected by a thin veneer of portland cement.

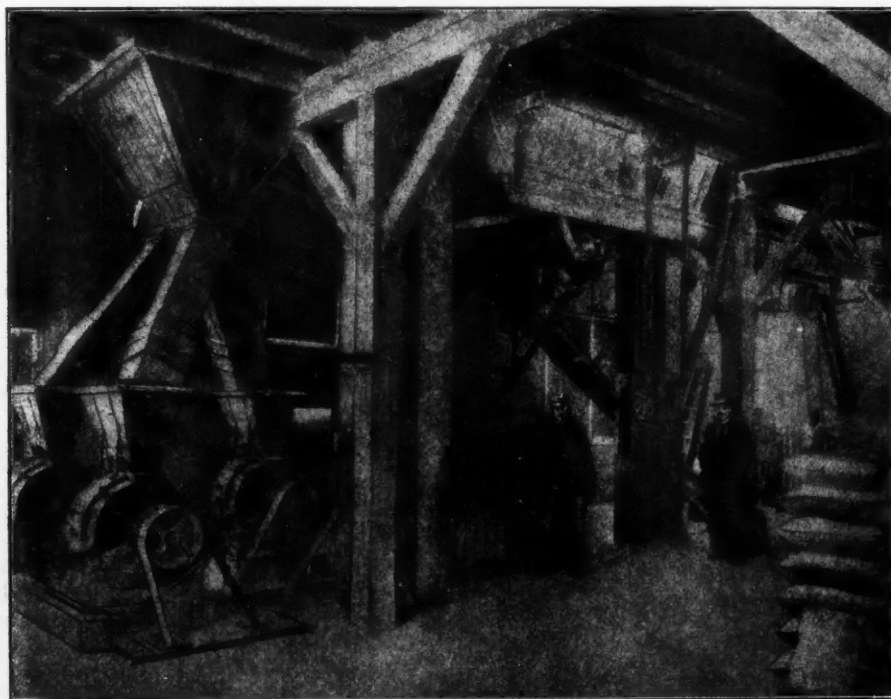
Figures and reliefs are characteristic of German architecture, and when not carved out of stone they are commonly made of gypsum and cement. Gypsum ornaments are hardened, colored, and rendered so weather proof that only close examination reveals the fact that they are made of more solid material. The gypsum figures and reliefs cost but a small fraction of the sum that would be required to produce the same ornaments in the stone which they so skillfully simulate. The fact that gypsum plaster expands on hardening, filling all the interstices of the

mixture of coloring matter without loss of strength. They stand in hardness about half way between Portland cement and ordinary stucco. (1) Keene's cement is a slow setting gypsum—alum plaster. Gypsum, preferably a white variety, unground, is burned at a red heat, then soaked in an alum solution, burned a second time at a red heat and then finely ground. If it is used with 20 per cent of water it has a tensile strength of 70 pounds and a crushing strength of 800 pounds per square centimeter. (2) Parian cement consists of 44 parts calcined gypsum and 1 part calcined borax. The gypsum is saturated with water having the borax in solution and burned at a red heat. It sets slowly and dries in 5 or 6 hours. It is used as a covering for both inner and outer walls, and may be painted or covered with paper. (3) Scagliola is a mixture of finely burned gypsum plaster and lime water, which is worked up into building slabs used for wall decoration.

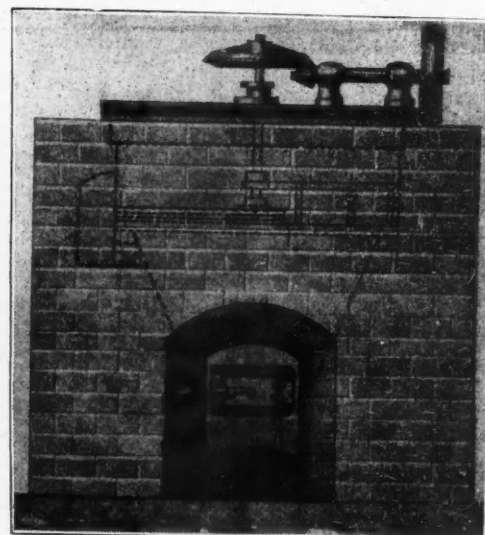
By estrick gypsum the Germans recognize a gypsum that has been heated to 1,000° F. and then coarsely ground. This high temperature destroys the power of rapid setting, and in American practice

burr mills, three sets of burrs being used in a mill of 100 tons daily capacity. Emery mills have recently been successfully introduced. In one German mill an American roller system of the pattern used for flour was found in operation. For the very fine dental plasters and for paint, air separation in connection with disintegrators of the Raymond type are used.

Calcining is the critical process in the manufacture of gypsum plasters, and for this purpose in American practice steel kettles of eight and ten tons capacity, eight feet in diameter and eight feet deep are used. Passing through the kettle are two flues. Two revolving arms to which chains are sometimes attached stir the material near the bottom. These arms are turned by a vertical shaft bearing a five foot horizontal crown wheel as shown in Fig. 2. When the kettle is filled, twenty horse power is required to turn these arms. At a temperature of 250° F. the plaster begins to "boil," great jets of dust and steam being thrown into the air. Presently the boiling ceases, but begins again at 280°. As soon as the plaster settles from the "second boil," it is drawn off rapidly, having reached a temperature of between 300° and 350° F. If heated to 400° it is "dead burned" and useless for wall plaster and plaster of paris, but may be used as a filler for glazed paper. In some cases a thermometer attached to a long stick is lowered into the kettles to determine the temperature, but ordinarily the operator decides on the proper time to remove the contents



VERTICAL BURR MILLS USED IN GERMANY FOR GRINDING GYPSUM.
(From *Prometheus*, by permission.)



GERMAN CALCINING KETTLE.
(From *Prometheus*, by permission.)

mold, renders it a most valuable material for making casts. Extremely hard figures capable of taking a polish may be made by subjecting the gypsum plaster to steam, and then filling the form with the steamed plaster and submitting it to hydrostatic pressure. As a protection against the weather the following processes are recommended: Warm the gypsum object and rub the surface with a mixture of three parts linseed oil varnish and one part white wax; or, impregnate the surface with sulphur balsam, consisting of fat oil in which sulphur has been dissolved (for instance, linseed oil at 250° F. and 10 per cent of sulphur). Another mixture highly recommended for protecting the surface of gypsum building ornaments has three parts of linseed oil, lead oxide equal to one-sixth the weight of the oil, and one part wax; or, the surface may be bronzed and otherwise protected with metal coatings. Mixtures containing gypsum which are recommended for ornamental purposes are: one part gypsum plaster and one part lime; or four parts gypsum, three parts white chalk or lime and one part white sand.

The following cements in which gypsum is the chief ingredient are alike in their essential properties. They are unusually hard, uniform in structure, set slowly and take a high polish. They may be fastened in thin slabs to nearly any kind of background, do not crack in drying, and permit an ad-

would be regarded as fatal to further usefulness of the gypsum. When allowed to set slowly, however, with protection from draft and heat, it becomes exceedingly hard, and is especially recommended as a floor material. Kilns for burning estrick gypsum are increasing in number in Germany, and this branch of the industry is said to be exceedingly profitable.

The processes in the manufacture of gypsum plasters are not elaborate. The mineral is either quarried on the surface by ordinary methods or mined. The Kansas "earth gypsum" used by nearly one-half of the mills in that State, lies on the surface and may be scooped out with scrapers. The rock gypsum is generally distinctly layered, and is often traversed by vertical cracks which aid mining. Its softness renders drilling easy, a 2 inch hand drill being forced through 3 feet of gypsum in 30 minutes in ordinary practice. When mined, the room and pillar method is generally employed. There are great opportunities for cheapening mining processes, for in no locality has the work of mining fallen into the hands of experts and the simplest methods only are employed. Before grinding, the gypsum is allowed to dry a few days, as grinding is rendered much more difficult by hygroscopic water. The mineral crushes easily in any of the crushers now in common use for stone, and is ground in

of the kettle by watching the behavior of the plaster. The time required to calcine eight tons, the contents of a kettle, is about 3 hours. Most mills are equipped with three calcining kettles. The use of 200 pounds of coal in calcining 1 ton of gypsum is average practice.

In Germany shallow kettles holding 2 tons each are used, the claim being made that calcining is not sufficiently uniform if deeper kettles are used. This, however, is open to dispute, for in the deeper kettles the constant rising of the steam from the bottom in explosive jets keeps the plaster in circulation. A continuous, rotating cylinder calciner is in successful operation at Mannheim and calcines satisfactorily a ton of gypsum with a hundred pounds of rather poor coal. The general plan of the calciner is like that of the rotary cement burner used in this country. Gypsum for the porcelain industry is not calcined in kettles, but after crushing is roasted for four hours at a temperature of 350° in ovens and then ground.

A mill capable of producing 100 tons of wall plaster per day of ten hours can, under present conditions, be erected for \$50,000.

Gypsum plaster is entering a field formerly held solely by lime, and has yet in but slight measure replaced lime. A canvass of the building trades of Chicago has shown that lime is used in 90 per cent

of the work for which gypsum, except for price, is more desirable. Practical builders were a unit in naming a price which is well within that at which gypsum can profitably be delivered in Chicago, and at which the demand for gypsum would increase tenfold. The future of the industry seems most promising. Portland cement, which might enter the same field, costs much more and can never come in competition in any phase of construction, except in localities where it is greatly favored by freight rates.

The recent efforts to organize the industry and place it under one management has met with some success, and a gypsum trust may be regarded as a certain factor in the gypsum problem of the future. It is not possible to predict the course that the industry so consolidated will take, but it may be assumed that instead of raising prices it will lower them to the point which secures the broadest market, and cheapen production.

In the world's production of gypsum France doubtless leads, with 2,000,000 tons annually. Germany follows closely with a slightly inferior tonnage, the exact amount of which cannot be stated exactly for statistics for Prussia, where most of the gypsum occurs, are not available. The United States stands third with 500,000 tons, or 750,000 tons if the Nova Scotia gypsum which is milled and sold in New York is included.

Of the various States, Kansas probably leads, with Iowa and Michigan rivals for second place. The average price paid for hard wall plasters at the mills of Iowa and Michigan in 1900 was \$4.75 per ton, and \$4.00 for plaster of paris. Detailed statistics for gypsum are given in the United States Geological Survey reports on non-metallic products and in *The Mineral Industry*.

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COPPER EXTRACTION AT FALUN.*

The old copper mine at Falun produces two classes of minerals known as hard and soft pyrites respectively. The former, consisting of mixtures of quartz and copper pyrites, contains about 3½ per cent, and the latter, which is mainly composed of iron pyrites, about 1 per cent of copper. The hard ore is roasted in heaps, about 10 per cent of sulphur being driven off, while the soft pyrites is treated in the sulphuric acid works, about 30 per cent of sulphur being utilized. The burnt residues, to the extent of about 45 tons hard and 12 tons soft per day, are mixed with salt (14 per cent and 10 per cent, respectively) and ground in ball mills. The hard ore mixture is then subjected to a chlorinating roasting in a Howell and White calciner, with a mechanical continuous-charging arrangement, treating 15 tons in 24 hours, and that of the soft ore is treated in a double bed calciner working through 7 tons daily.

When complete chlorination, as shown by the ordinary tests, has been effected, the roasted material is transferred to wooden vats, where the cupric chloride is dissolved out by weak sulphuric or hydrochloric acid, the latter being obtained by condensing the waste gas of calciners, three classes of liquor, namely, acid wash or water from previous charges, and clean water, being used successively, the last going back as second liquor to a following charge. The liquor contains all the copper, bismuth, selenium, and silver, together with a portion of the gold contained in the ore, the remainder of the latter being extracted by a subsequent washing with chlorine water. The copper liquor is precipitated by scrap iron as cement copper, which, together with the associated mud and iron salts, is re-smelted and granu-

lated for conversion into copper sulphate by means of dilute sulphuric acid and air in the ordinary way. The residual mud from the blue vitriol crystallizes containing gold, silver, selenium, and bismuth, is dried and smelted with litharge soda and sawdust to collect the precious metals in lead. The gold-bearing liquor from a chlorine extraction is reduced by adding a portion of the original copper extraction liquor containing ferrous chloride, which reduces the chloride of gold, producing gold and ferric chloride. The gold so obtained is extremely finely divided, and an addition of lead acetate and sulphuric acid is necessary to obtain a sufficiently dense precipitate. This is smelted with lead in the same way as the copper residues. The waste liquor from the copper extraction is worked up for ferrous sulphate, which by calcination gives red color (rouge or colcothar), a substance that is used for house painting in Sweden, about 1,000 tons being made yearly.

The annual production of the works is as follows:

	Tons.
Copper sulphate	1,600
Ferrous sulphate	300
Iron oxide red paint	1,000
	Kilograms.
Silver	400
Gold	100

BRITISH COLUMBIA MINERAL PRODUCTION.

The annual report of the Minister of Mines of British Columbia which has just been issued, gives some interesting data.

The total value of the various mineral products of the Province up to and including 1901 was \$172,241,988. The product of the mines in the province during 1901, was \$20,086,780; the per capita mineral production of the Province for 1901, was \$134.

The production of lode mines in 1901 is valued at \$13,683,044, an increase over the previous year of \$3,613,287, or 36 per cent.

The tonnage of ore mined in 1897 was 169,362 tons; in 1898 it had increased to 215,944 tons, or about 27.5 per cent; in 1899, to 287,343 tons, or 33 per cent over 1898; in 1900 to 554,796 tons, or 93 per cent over 1899; in 1901 to 920,416 tons, or 66 per cent over 1900.

While this great advance in tonnage is chiefly due to the enlarged output of mines previously in operation, there have also been a number of new ones added to the list during the year 1901. There were in all 119 mines shipping during the past year, of which 78 shipped over 100 tons. The greater part of the ore came from the West Kootenai District, from the mines Ainsworth, Nelson, Slocan and Trail. The records show that 3,948 men were employed in all the mines of the Province. Incomplete returns from nonshipping mines indicate that these number 47, and employed 374 men, of whom 227 worked below ground, and 147 above ground.

The following table shows the value of the mineral production of British Columbia in 1901:

Gold	\$5,318,703
Silver	2,884,745
Copper	4,446,963
Lead	2,002,733
Iron	17,238
Coal	4,380,993
Coke	635,405
Other materials	400,000
Total	\$20,086,780

The gross output of coal during 1901 was 1,691,557 tons, of which 221,226 tons was used to make coke, so that the net output for the year was 1,460,331 tons of coal and 127,081 tons of coke. This showed an increase of 1.5 per cent of coal, and 49 per cent of coke over the production of the former year. Most of the product was sold abroad, 895,197 tons being exported to the United States, and 18,966 tons to other countries, while 413,705 tons were consumed in Canada. The greater part of coke produced in the province was, however, consumed at home. Of the 127,533 tons sold, 80,154 tons were for consumption in Canada, and 47,379 tons were for export to the United States.

An increase of about 12 per cent is shown in the gold productions of the Province, including both placer and lode, and valued at \$5,318,703. The placer mines produced less in 1901 than in 1900, a decrease

of \$308,624. The output of the placers for 1901 amounted to \$970,100, whereas the lode mines produced \$4,348,603, a gain of \$895,222, or 26 per cent over the previous year.

The total quantity of silver produced in 1901 was 5,157,333 ounces, valued at \$2,884,745. This is an increase of more than half a million dollars in value.

The production of lead was 51,582,906 pounds, worth \$2,002,733, a decrease in value of about 25 per cent as compared with the production of 1900. In that year, there was a phenomenal increase over 1899 of 206 per cent.

The copper production for the year was 27,603,746 pounds of "fine copper" valued at \$4,446,963, an increase of 17,606,666 pounds, and of \$2,831,674 in value over that of the previous year.

A small quantity of platinum—about \$457 worth—was produced from the Similkameen district.

Statistics show that 5,746 tons of iron ore were shipped, which were used for experimental purposes, or as flux in smelting other ores, as no blast furnaces exist at present in British Columbia.

MINERAL OIL FIRING FOR OPEN HEARTH FURNACES IN RUSSIA.*

In the steel works in the neighborhood of St. Petersburg steel melting and re-heating furnaces are fired with naphtha residues (mazut), costing 13s. per ton at Baku and 45s. at the works. In the earlier or drop system, which is similar to that originally adopted in the Willenstrom furnace, the oil is fed in drops through a series of apertures in the roof of a small heated chamber in the neck of the gas flue, where it is vaporized and fired by the heated air from the air-flue above. This arrangement is fairly suitable for heating furnaces, but with the higher temperatures required for steel-melting the wear in the combustion chamber is considerable, and complete repairs are required after about fifty heats. The system now generally adopted is to gasify the oil in the gas regenerators, after subjecting it to a preliminary heating by steam coils at 40 or 50 degrees C. in storage cisterns, whence it is pumped into an accumulator giving from 5 atmospheres to 7 atmospheres pressure. The feed is effected by a Korting pulverizing injector, with nozzles of varying aperture from 1½ to 3 millimetres, blowing into the side of the regenerator near the bottom. A small accessory air supply is introduced at the same time to burn the first portion of the oil-gas which would otherwise choke the brickwork by a deposit of coke. The arrangements of the regenerator are similar to those for producer gas, except that the arch of the chamber must be raised about 6 inches, as the specifically lighter oil-gas attacks the brickwork very readily. A newer and better method, which, however, has as yet not been generally applied, is to feed the furnace through concentric nozzles, the inner one carrying the oil and the outer one air at high pressure, when absolutely perfect combustion is obtained and the gas regenerators are dispensed with. In this system five water-cooled injectors are required, two for each end of the furnace, and a central one in the crown of the arch. Under ordinary working conditions, with 10 ton to 15 ton open hearth steel-melting furnaces, the consumption of oil is about 20 per cent, or in some cases 18 per cent of the weight of the materials charged, the endurance of the furnace and the speed of working being about the same as with producer gas-firing.

MICA IN FRENCH GUINEA.—Dr. Heckel, director of the National Colonial Institute at Marseilles, in a recent bulletin, says that French Guinea possesses important deposits of mica, recently discovered. Samples of favorable appearance are at the disposition of all who care to see them at the Colonial Museum, 63 Boulevard des Dames. It is added that any one desiring to correspond on the subject of the exploitation of these mica deposits should address inquiries to M. Famechon, directeur des douanes, at Conakry, French Guinea, Africa.

*Abstract of a paper by A. Bystrom in Oesterreichische Zeitschrift für Berg-u-Hüttenwesen.

*From Berg-und-Hüttenmännische Zeitung.

THE PRESERVATION OF LIFE IN THE WITWATERSRAND MINES.

By T. LANE CARTER.

Given the most favorable conditions, mining still remains one of the most dangerous of trades, and although in this country we are not called upon to undergo those terrible catastrophes which take place in American mines, where hundreds of men lose their lives, nevertheless the mortality here is quite high enough. The fact that during the war just ended the mortality of idle miners was greater proportionately than of soldiers in action has made people realize more than ever what a dangerous occupation mining is, even here. When the war broke out many of the rock drill men working in the gold mines went to England. So many of them died there that the occupation of a rock drill man was looked upon as fatal. The doctors say that the change from the high altitude and light air of Johannesburg to the heavy atmosphere of an English winter brought on most of the deaths and that the majority of these miners would be living to-day had they remained here.

The dangers from running rock drills in this country may be considered under four headings, namely: (1) dust, (2) exposure, (3) fall of rock, (4) explosives.

I think dust can be put down as the greatest destroyer of life. It is a most insidious foe, and does not receive the blame it deserves. Many and many a miner pines away, and when he dies no cause is given for his death save a natural one. In making out the returns of deaths at the mines for a year, it is an easy matter to account for deaths from direct causes, such as fall of rock, breaking of haulage ropes, etc., but how seldom the indirect causes receive justice at the hands of the statistician! It is the indirect action of the dust which makes it so difficult to deal with. Even the most unintelligent miner can be made to appreciate the dangers of a treacherous roof, or poor dynamite, but it seems impossible to make him realize the slow but sure dangers of dust. If you provide a respirator he might wear it for a little while, but soon becomes tired of it and throws the thing aside, preferring to work unhampered than to be bothered with a contrivance over his nostrils, even though it prolong his life. To the coal miner the danger from dust might seem exaggerated, for he knows that in coal mines men live for years in an atmosphere as dusty as the gold mines. Quite so, but the dust is completely different. Examine the two kinds with a magnifying glass. The coal dust is soft and friable, whereas the dust from a Johannesburg mine is exceedingly sharp and incisive. The miner works in this atmosphere of dagger-like dust for a long while before he realizes the damage done to his constitution. When the dust settles on the lungs, cutting of the tissues commences. After a while he begins to cough. The lacerated lung is unable to resist the bacteria of tuberculosis, and consumption or "miners' complaint" soon carries him off.

Two remedies have been suggested for this evil. First, keep the dust from forming as much as possible, and second, compel the miners to use the most approved respirator. Several suggestions have been made to prevent the formation of dust. A small jet of water continually playing on a "dry" hole is the proposed way of preventing the dust from rising from a drill at work.

The very fine dust produced by the explosions which settles all over the stopes, and which is disturbed when the stuff is shoveled into cars, is more difficult to deal with. In those parts of the mine where no water runs it is difficult to see how it is to be kept down. If the men could be forced to always wear respirators the difficulty is solved. Some medical officers go so far as to recommend a strict regulation that all white employees in the mines should be compelled to wear respirators. This may be carrying the idea too far, but miners who run rock drills in raises or drives should certainly be forced to use respirators all the time.

Not so much attention is given to the Kaffirs as

to the white miners, for the simple reason that scarcely any of them stay long enough on the mines to suffer from the adverse conditions. A white man frequently works on until he drops, but a black one never. If one attempts to help the Kaffirs in any way the kindness is often resented. For instance, the other day I found three Kaffirs working in a winze, about 100 feet down. Upon entering the winze my candle went out, from bad air, so that I turned on the air tap to improve the ventilation. The Kaffirs were not at all pleased, and begged me to turn off the air, as it made their candles burn so fast that at the end of the day they had none left for illuminating their rooms at night.

The next cause of the mortality among underground men is due to exposure. In such a climate as this care must be exercised in the selection of the best wearing apparel. Pneumonia is easily contracted, and is very dangerous. If one could see a miner working in a close, warm stope until he was in a dripping perspiration and then stand near the exhaust of a rock drill, in order to cool down, one would not wonder that pneumonia attacks them. The more careful miners wear good woolen underclothing and warm sweaters all the year round.

Falls of rock are responsible for less deaths here than in most parts of the world. There are exceptional cases, of course, but as a rule the hanging wall of the mines here is all that can be desired. The open stopes with comparatively no timber or other support, only an occasional pillow here and there, strikes the American miner as one of the wonderful things about mining in this country. There are times when the roof completely upsets your calculations and comes down unannounced, but the intelligent miner soon gets to know his hanging wall so well that with a little care he should escape accidents from falling rock.

In places where the roof is really bad the best practice here is to leave pillows in the stopes and not to build up pack walls after the material is all removed, for no matter how carefully the packing is done it never answers as well as a pillow left in place. Especial care is taken in stopes where faults and dikes are met, ample rock being left to support the roof, which is always dangerous in such places.

The number of accidents from explosives could be reduced to almost zero, if sufficient care were used by the miners in handling this dangerous material. The high explosives used here are of the best quality, and can be thoroughly relied upon, if treated with proper respect. There is no excuse for the miners' carelessness, for copies of the mining regulations regarding explosives are posted in conspicuous places, and full directions how to properly use the dynamite are found in every box of explosives. But in spite of all this they are at times very careless, illustrating the truth of the old saying, "familiarity breeds contempt."

When caps, fuse and dynamite are found in the same box, as frequently happens, the miner's blasting certificate is generally taken away for three or four months. I do not think Nature intended miners to use their teeth in fixing the percussion caps on the fuse, yet many miners bite the copper cap to the fuse, instead of using a pair of clippers. Considerable damage is done to the miners by fumes from the dynamite, known locally as being "gased." This is due to no fault of the dynamite, but to the miner's eager desire to go back to his working face, for the second blast.

The dangers of mining are confined to the underground work. Notwithstanding the deadly nature of the cyanide solutions, the number of accidents in the cyanide works are remarkably small. The practice here of having the cyanide tanks out in the open air should be followed wherever possible, for the danger from hydrocyanic acid gas is completely done away with. The solution sheds also are so well ventilated that there is no danger from this fatal gas. The only danger is from accidentally swallowing some solution. Although it is not legally required most of the cyanide works have ready a solution of peroxide of hydrogen, to be used hy-

podermically in case some of the solution is swallowed.

In the treatment of zinc slimes a good deal of sulphuric acid is used. Where it is carried in buckets, there is always a danger of nasty burns. For this reason a soothing soap or salve is a good thing to have about. An excellent salve for this accident is made by mixing a concentrated solution of lime with pure olive oil, and is employed in some plants for acid burns.

THE MINER IN POLITICS.

[SPECIAL CORRESPONDENCE.]

Scranton, Pa., Aug. 25, 1902.

There are rumors in the anthracite region that the strike will end on or about September 1. While this is a consummation devoutly to be wished, there is a possibility that the United Mine Workers will endeavor to carry the strike over until the September elections take place. This will be difficult, but not impracticable. President Mitchell and his officers are possessed with the idea that the miners have great political influence; that it is possible for them to decide the fate of the Gubernatorial, the Congressional and legislative candidates for Pennsylvania. This is a grave misconception of the miners' political influence.

It counts even less than its numerical strength on the register. Not many of the foreigners have votes, and those who have seldom cast them. The miners' vote is partisan and factional. The Welsh vote is solidly Republican; the Irish is Democratic. Each of these sections will support the nominated candidates of their own nationality without the slightest reference to labor troubles or labor problems. In the last legislative election in Lackawanna County two active agitators who were instrumental in founding the union in that section were defeated by overwhelming majorities in districts where the miners' votes outnumbered all others by three to one.

Another fact which will nullify any preconceived effort on the part of the union to integrate the miners' vote and cast it solid for any particular candidate "fair" or "favorable" to the miners' preposterous claims is that the agricultural vote of Northeastern Pennsylvania is thoroughly aroused against the miners. So bitter is this feeling that the farmers refused to hire miners when they were sorely pressed for help. The business interests will also express through the ballot box sentiments which it is afraid to utter in public.

Mitchell's idea is to pledge a sufficient number of candidates nominated or elected to the Legislature to vote for laws which will either ruin or embarrass the operators. During the last session of the Legislature the union sent to Harrisburg the "strongest lobby" that was ever seen there. At its instance bills were drawn and presented which would have made coal mining in the anthracite regions impossible on a commercial basis. The "company store" was declared illegal, and a very good thing it was for the company, and, as time will show, a most unfortunate one for the miners. Nominated mine inspectors were superceded by elected inspectors. The candidates who either sought or received the nomination are working miners, some with foremen's certificates, but who know as little about mining as they do about civil engineering. All the remaining bills presented by the union, or in its interests, were rejected. After the Legislature was adjourned the sky was rent with cries of "treachery," "baseness," "bribery" and so on. The miners would two years hence nominate their own representatives and elect them.

As a matter of fact, not a single miner has been nominated by the Republican party. The Democrats may nominate one or two, but their election is not likely.

The operators will have to pay particular attention to Harrisburg at the next session of the Legislature, not merely for the conservation of their property, but to protect the miners from reckless legislation which would endanger their lives and their earning power alike.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

WHEN DECISION OF LAND IS NOT DETERMINATIVE.—The decision of the Federal Land Department in rejecting a locator's application for a patent to a placer mining claim, for the reason that the applicant failed to show that the ground was valuable for mining purposes, or that he had made the requisite improvements, is not a decision that the ground was not placer ground, and *res adjudicata* in an action by the locator of the placer mining claim against a subsequent locator of a lode mining claim. And such decision is not *res adjudicata* where the lode location was subsequent to the decision, and the parties before the department were not the same.—*Clipper Mining Co. v. Eli Mining & Land Co.* (68 *Pacific Reporter*, 287) Supreme Court of Colorado.

ASSUMPTION OF RISK BY WORKMAN WHERE BLASTING IS BEING DONE.—While an employe assumes the known risks of his employment, he assumes them with all of their qualifications, which include the exercise of care which the employer is accustomed to use to obviate or minimize the danger of the risk. It was not erroneous for the trial court to refuse an instruction to a jury that an employe could not recover for an injury alleged to have resulted from the negligence of the employer in failing to make proper examination and test of a ledge of rock before a blast was made, if he "had as good an opportunity as the superintendent to examine the situation" where he was not charged by his employment with any duty in that respect, and the defect which caused the accident and led to the injury was not so obvious that he must be held to have known of it as a matter of law.—*Rockport Granite Co. v. Bjornhold* (115 *Federal Reporter*, 947) United States Circuit Court of Appeals.

WHEN PARTIES ARE NOT LIABLE FOR MACHINERY NOT SUPPLIED.—A lease of a mine was made under such circumstances as implied that profitable development of the mine and its subsequent operation were a mere expectancy. Expenditures for machinery and improvements to be supplied and made by lessees were to be reimbursed from ore taken from the mine. Limitation was placed on the operating expenditures and accounts were to be kept, so that the parties could determine the net profits which were to be shared. It was held that while forfeiture for non-performance of conditions, or abandonment, was at the election of the lessor, the latter could only recover in an action for same whatever loss was substantial, the damages being either nominal or substantial, according as the mine proved profitable or otherwise, and the costs of machinery, tools and improvements which lessees failed to make or supply was not a liability for which recovery could be had.—*Cleopatra Mining Co. v. Dickinson* (68 *Pacific Reporter* 456.)

EXCEPTION AS TO MINERALS IN DEED.—Under the laws of New York, as settled by its Court of Appeals, marble in place is a mineral, and the title to same does not pass by a conveyance of the land which excepts and reserves to the grantor all mines and minerals which may be found in same. Under those laws a lease of land for a term of years with the right to dig, quarry and use "all or any marble, stone or other valuable material substance" found in same, but which excepts and reserves "mines and minerals, as specified in original conveyance" where the deed under which lessor holds title expressly excepted and reserved therefrom all mines and minerals found in the land, conveys to the lessee no title to the marble in place in the land, and will not support an action by the lessee to recover the value of marble quarried and removed from the land at a time when he was not in possession.—*Phelps v. Church of Our Lady* (115 *Federal Reporter*, 882) United States Circuit Court of Appeals.

LODE CLAIMS WITHIN PLACER CLAIMS.—The existence of a lode within a placer claim must be a matter of actual knowledge at the time of the application

for a patent to the placer claim in order to authorize a subsequent location of a lode claim within the limits of the placer claim, and a general belief in the existence of lodes in such territory is not sufficient. A finding of a court that a subsequent locator of lode claims entered upon a prior existing placer claim and discovered and located lodes in same, is in effect a finding that such lodes were unknown at the time of the entry, making it unlawful. And since the locator of a valid placer claim is entitled to the exclusive possession of unknown lodes within the limits of his claim, a subsequent locator of such lodes is a trespasser, as against the placer claimant, and as such obtains no title to such lodes. A judgment against a subsequent locator, based upon the proposition that in no case can a location of a lode claim be made within the limits of a placer claim, such proposition being erroneous, will not be reversed, when the findings of that court show that the lodes were unknown at the time of such subsequent entry by the lode claimant.—*Clipper Mining Company v. Eli Mining & Land Co.* (68 *Pacific Reporter*, 286) Supreme Court of Colorado.

ABSTRACTS OF OFFICIAL REPORTS.

French Rand Gold Mining Company, Limited.

This is the fifth report of this company, and covers the period from January 1, 1899, to December 31, 1901. The report states that owing to the outbreak of hostilities in 1899 and the refusal of the late government to allow workmen to remain on the property, the mine was closed down, but arrangements were made for the protection of the mine, and the directors report that the company's property was not interfered with, and that both the mine and the surface plant had been kept in good order. The manager's report deals in the first place with the operations of the mine until up to the outbreak of hostilities, and second, with the war period. The engineer's report gives full details as to the tonnage development. During the period for which the report is made a considerable amount of work was done in connection with the increase of the mill to 120 stamps. The cyanide works have been almost completed, and an addition to the mill has been erected, a large amount of machinery has already been received, and the remainder necessary for the completion of the improvements, is being brought forward as rapidly as possible. The directors hope to have the full equipment of 120 stamps running by the end of 1902. To meet the financial requirements of the company a loan of £150,000 was negotiated in May, 1899, which it was anticipated would be sufficient to liquidate the liabilities of the company and to increase the mill of 60 stamps, to 120, with corresponding additions to the cyanide plant. Owing to the war, however, and the consequent shutting down of the mine for over two years, these funds were exhausted before the end was attained, and further loans were made from time to time, so that the total amount borrowed up to December 31, 1901, was £212,137 15s. 7d.

The balance sheet for December 31, 1901, shows the total capital to be £660,000 in shares of £1, of which 560,000 shares have been issued.

LIABILITIES.			
	£.	S.	D.
560,000 shares of £1 each.....	560,000	..	..
Bonds outstanding.....	179,980	..	..
Loans with interest.....	212,137	15	3
Amount reinvested as per balance sheet, December 31, 1898.....	66,687	6	5
Other indebtedness.....	26,769	5	2
Total.....	1,045,574	6	10
ASSETS.			
	£.	S.	D.
Mining claims and other property.....	457,132	19	7
Shafting development, buildings, machinery, etc.....	467,958	6	5
Railway siding, dams and reservoirs, surface improvements.....	12,534	2	1
Furniture and fittings, gold seized by Government, cash at bank, etc.....	37,188	15	7
Balance to appropriation account.....	974,814	3	8
	70,760	3	2
Total.....	1,045,574	6	10

The manager's report shows that the total amount of shaft sinking up to date of the report amounts to 6,897 feet. The details of development to December

31, 1901, other than shaft sinking consists of 9,583 feet of drives on the main reef, 6,612 feet on the south reef, 6,053 feet on crosscuts, 3,922 feet in rises, 876 feet in winzes and 2,353 feet on stope-drives, etc. Total amount of ore developed on the main reef, 189,281 tons, and on the south reef 116,072 tons. The ore sent to crusher amounted to 104,601 tons, from which 27,857 tons of waste rock were sorted. The bullion yield in the mill during 1899 up to October, when the mine was closed down, was as follows:

	Yield in bullion.	
	Ounces.	Value.
Tons crushed.....	76,744	25,231
Cyanide plant, tons treated.....	59,175	17,911.2
Total value.....		£157,123

The total cost of operations was £137,120, leaving a profit for the year of £20,008.

Tolima Mining Company, Limited, Colombia.

The report of this company, owning mines in Colombia, as issued from the London office, covers the year 1901. The directors' report says: "Those who have watched the course of events in Colombia must have anticipated a financial loss. The directors are, on the whole, satisfied that the loss has not exceeded the sum of £6,593. Although the company has fairly maintained its machinery, plant and property, its pecuniary resources have been most severely taxed by the emergencies of a situation which, whilst necessitating continued standing expenses, has excluded all opportunity of making returns for outlay. The political situation during the year 1901 has necessarily entailed great anxiety respecting the maintenance of the 15 miles of ditches or watercourses upon which the machinery depends for its motive power. Similarly, the utmost solicitude has been induced by the difficulties encountered in keeping the timbering at Frias in good order, which in so extensive a mine requires much manual labor both underground and on surface. The maintenance of an adequate supply of mine stores and food stuffs for the workpeople and their dependents was also a source of anxiety; and the wisdom of the policy, so long followed by this company, of keeping a reserve of stores on their establishment, has been under the above circumstances fully justified. The cessation of hostilities, so confidently expected at the last annual meeting, and so nearly attained shortly afterwards, unfortunately did not take place within the period now under review, the war having been actively prosecuted, especially in the Department of Tolima, and at times in close proximity to the company's property up to the latest advices from the mine. An announcement in the London Press has been made that the revolution is at an end and peace restored; the directors have as yet received no confirmation of this from the company's superintendent, but they have reason to believe that, at any rate, negotiations between the parties are far advanced, and that a peaceful settlement cannot be far off. On the return of normal conditions, the directors look forward with confidence to the restoration of prosperity, both in the country and in the mine, provided that the latter has sufficient capital available for its development.

"The extraction of export mineral during the past year was limited to about 138 tons, but new estimated reserves were opened up to the extent of about 171 tons, thus leaving a slight increase in the total estimated reserves at the end of the year 1901. The limited work of exploration in the Frias Mine yielded few discoveries, but it proved the persistence of the lode in the deepest parts of the mine, viz., in the 180 fathom Level East, the 160 fathom East Winze, and the 120 fathom East Level, which latter gave 13½ fathoms of highly productive ground. The 160 fathom West, too, has given good indications. In the Plaza Mine (which may prove to be quite as productive as the old mine) the No. 4 East Level (driving west) has proved 75 feet of highly productive lode. The shaft is being sunk as quickly as is at present possible to the No. 5 East Level in order to test the continuance in depth of the lode; whilst in the Nos. 3 and

4 levels mineral reserves have been opened out to the extent of 154 fathoms, estimated to yield an average of $\frac{3}{4}$ ton of very high-grade mineral per fathom. Of the 909 tons of mineral reserve now classed as proved, 683 tons are claimed by the old Frias Mine, estimated to yield 204,900 ounces of fine silver, or, at the present price of silver, about £22,144, whilst 226 tons in the Plaza Mine are estimated to contain 113,000 ounces of fine silver, which, at the same price, gives £12,212, or a gross total value of mineral reserves of about £34,356—a total which, in view of all drawbacks, compares favorably with the past. During 1901 no mineral could be despatched from the mine, and there are now about 500 tons ready and waiting for transport to the coast.

"The excess of expenditure over receipts during the revolution has entirely absorbed the company's available cash reserve, and funds will have to be found for current expenses and for the vigorous prosecution of the underground works. Every endeavor has been made in the direction of effecting all possible economies at home and abroad; the directors are now drawing only half their fees, and the secretary's salary and the office expenses have been reduced. It will be in the recollection of the shareholders that in the year 1888 the company was very much in the same financial position as it finds itself to-day. The directors then made an issue of debentures which tided the company over its difficulties. These debentures were subsequently redeemed (in the year 1891) after the mine had been again well opened up and very large dividends paid. The directors have appealed to the shareholders again to subscribe to a similar issue of debentures, and they have every confidence that if a hearty response be made to this appeal the same happy results will be attained."

The Anglo-French Quicksilver and Mining Concession of China, Limited.

This is an English corporation, owning quicksilver mines and smelting works in Kwei-Chau Province. The directors' report, which covers the year ending August 31, 1901, states that the political troubles which affected all business in China continued during a part of the year 1901, but these troubles being now at end business of the company has been resumed and considerable progress has been made. Operations have been in progress at Dah Siao Tung Mine, Wen Shan Chiang. The work has been chiefly devoted to opening up, but ore sufficient to supply the furnace for some time when smelting operations are commenced has been incidentally secured. The erection of the smelting plant has been impeded by the great difficulties of transport, resulting in the breakage and loss of a number of fire-tiles which are absolutely required in the construction of the first furnace. A second furnace has been designed, in the construction of which no tiles are required. Everything else at the mines is quite ready, and systematic mining can, therefore, be at once carried on when the furnace is completed.

The balance sheet shows that the nominal capital of £310,000 is composed of 130,000 cumulative preference shares, 130,000 ordinary shares, 50,000 founders' shares, all of the value of £1 each; of these 190,000 shares have been issued as fully paid, and 120,000 cumulative preference shares have been subscribed for at 10s. each, the whole representing an actual value of £250,000. Sundry debts are placed at £4,439 4s. 1d. Assets include mining concessions, etc., costing £212,000. Expenditures in China, London and Paris, including plant, machinery, etc., £30,836 6s. 7d. Other assets, including cash on hand and on deposit, £11,603 17s. 6d.

The engineer's report states that the country in which the property is located was originally a vast limestone plateau.

A careful system of sampling and assaying which was organized about a year previous to the making of this report shows that the value of ore mined and roughly sampled varies from 0.7 per cent to 5 or 6 per cent mercury.

The mine buildings are divided into two compounds known as the residential and the smelting.

The compounds are surrounded by a strong masonry wall, and contain the following buildings: Manager's house, quarters for European employes, servants' quarters, office, quarters for Chinese staff, quarters for Chinese workmen, carpenters' and fitters' shop, stable, storehouses, powder magazines, in all a total of 20 buildings. Considerable attention has also been given to the making of roads, paths, ore sorting floors and sorting houses.

The smelting plant, which has just been completed, comprises 1 ore bin building, 1 tile furnace, 3 masonry condensers, 3 wooden condensers, 1 aspirating fan, 1 portable engine and boiler. The ore bin building has a capacity of 350 tons, and is connected to the smelting building by a trestle supporting a rail track, the cinnabar being delivered in cars direct from the bins to the charging floor above the furnace.

The furnace is of the modern Granitza type, and is designed to treat approximately 12 tons of ore in 24 hours. The ore is fed into the furnace from the charging floor above, through a feed hopper, and the residues discharged into cars running from said discharge to the dump heap. The fuel used is charcoal, and the approximate amount required per day of 24 hours is 2,400 lbs. The mercury vapor, etc., is drawn through a flue pipe by induced draught into the first condenser of masonry. There are three masonry condensers, side by side, each condenser having a series of cement-lined chambers through which the mercurial vapors are drawn and condensed. Following the masonry condensers are three wooden ones, the passage of the remaining vapors, etc., being intercepted by vertical partitions extending alternately from the roof and floor of condenser.

The question of fuel is an important consideration. In the event of the borings for coal being successful, there is still the question of the transport from the deposit to the works. It is safer for the present, therefore, to base all calculations on charcoal as fuel. This necessitates acquiring timber rights over large tracts of land. The nearest forests are, fortunately, within 10 miles of the works, and arrangements will be made whereby the company will eventually fell its own timber and produce its own charcoal. As labor is so cheap, it will probably be found best to transport the charcoal by coolies. Meantime, arrangements have been made to obtain from local producers a regular supply for the furnace already in process of erection, the price being about 10s. per ton delivered at the mines. The underground work has been pushed steadily forward, and as the old workings are cleared out and placed in order new levels are driven, so it will be possible to increase the number of miners and the amount of development. At present, stoping operations have not been commenced, the object of the management being to open up as much ground on the various ore bodies as will enable a steady supply of mineral to be forthcoming for the smelting operations. At the present stage it would not be possible to give an estimate of the ore reserves, the blocking out of which is proceeding as rapidly as circumstances will permit. As no attempt has been made yet at stoping, it follows that the only mineral brought to surface is that obtained in driving the levels. There is at present some 360 tons, averaging $1\frac{3}{4}$ per cent mercury, stored in the ore bins awaiting treatment. As soon as the smelter is in regular operation stoping will be started.

The underground work will continue to be pushed forward with a view to opening up the ore bodies and affording a large and regular supply of cinnabar for smelting purposes. Arrangements are being made for connecting the various workings with the smelter. This in itself is a difficult and somewhat complicated piece of work, owing to the extremely rugged nature of the country. The scarcity of water is a drawback, especially with regard to the condensing arrangement of the smelting works. At the time the company was inaugurated, it was suggested that large concentrating works should be erected on the Yuen River, at Lung Tchi Kow. This is a matter which is under consideration, although it is not pressing at the present moment; the

policy of the company being to gradually increase and improve the smelting arrangements on the property, and to obtain a large and regular output of mercury before erecting any elaborate and expensive machinery at Lung Tchi Kow, which, apart from its first cost, would involve the laying of a tram or rail from the mines, a distance of some 17 miles.

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

Twelfth Census of the United States. Volume VII. Agriculture. Part II. Crops and Irrigation. Prepared under the supervision of Le Grande Power, Chief Statistician for Agriculture. Washington. United States Census Office. Pages, 880. Illustrated.

United States Department of Labor. Labor Conditions in Cuba. By Victor S. Clark, Ph.D., with other papers. Edited by Carroll D. Wright, Commissioner. Washington. Government Printing Office. Pages, 217. Bulletin.

Annual Report of Minister of Mines for British Columbia. Statistics of Mineral Production. By William Fleet Robertson, Provincial Mineralogist. Victoria, B. C. Printed by Richard Wolfenden. Pages, 1,232. Illustrated.

BOOKS REVIEWED.

Investment and Speculation in British Railways. By William J. Stevens. London; Effingham Wilson. Pages, 272.

This is a manual giving views of railroad capitalization and management from the standpoint of the investor. After a general introduction treating of railroad capital, revenue and expenses, the writer takes up all the important British railroad companies and carefully analyzes their position and prospects, as indicated by their recent reports. The work is intended for British investors mainly; but some work on the same lines would be useful here.

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.

Radium.

SIR:—During a stay of several months in El Paso, Texas, in 1892, my attention was attracted by the peculiar purple tinge showing in pieces of broken white glass wherever observed lying on the ground. Upon my return to El Paso, a couple of years later, to take charge of the El Paso smelting works, my attention was again attracted by the same purple coloration of pieces of glass, in some cases almost amethyst in its deepness. I called this to the attention of several persons, who confirmed the observation. When I had noted this coloration previously I was not fully convinced that an actual change in color had taken place in glass originally white, but now I became convinced that it was an actual change in color, and also believed that the mere action of light was not wholly responsible, but that the pieces of glass scattered on the ground were the ones affected. I wondered if small traces of manganese in the glass could in some way be changed into permanganate of potassium. But how?

This observation of the purple coloration of the glass has lately recurred to me in the light of the more recent discovery of Becquerel rays and their property of turning white glass purple. Does it sug-

gest a possible explanation? May it be that pitchblende may have concentrated at the sudden widening of the Rio Grande at Courchesne so that the soil about El Paso has sufficient radium to account for this coloration?

It might be of interest to those mineralogically inclined, should they observe such a purple coloration in bits of glass scattered on the ground, to see if they could trace it to the presence of uraninite.

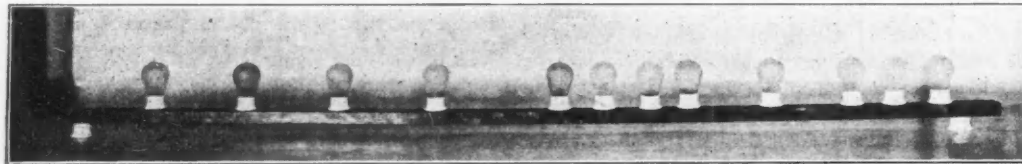
R. C. CANBY,
Santa Barbara, Chihuahua, Mexico.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.)

Buyers of Soapstone and Talc.—Who are the principal purchasers of talc or soapstone? What is the usual price per ton? Is it shipped in barrels or sacks?—W. L. I.

Answer.—Pulverized talc is used as a filler or makeweight in paper making, also as a base for fire-proof paint and for dressing canvas used in packing houses for covering hams, bacon, etc. A small amount of high-grade is used in making toilet powders. Largest consumers are the International Paper Company, 38 Park Row, New York City; Swift & Company, Chicago; Armour & Company, Chicago. Pulverized talc is usually shipped in bags. Prices are quoted weekly in the *ENGINEERING AND MINING JOURNAL*.



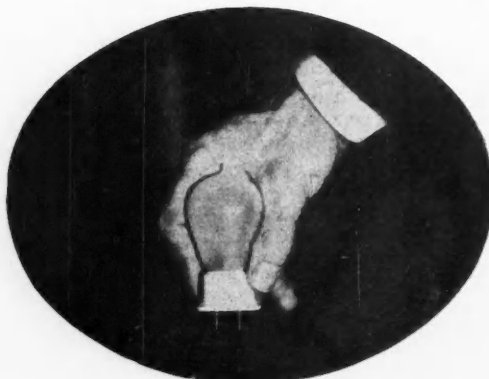
ELBLIGHT LAMPS ATTACHED TO CABLE.

PRODUCTION OF BUILDING STONE IN 1901.—The value of the entire production of stone in the United States in 1901, as reported to the United States Geological Survey, was \$60,982,060, a gain of \$12,295,405 over the value of the product of 1900. This great increase in value was shared by all kinds of stone. Limestone, including blast-furnace flux, showed the greatest increase, from \$20,354,019 in 1900 to \$26,406,897 in 1901, or 30 per cent. Granite showed the next greatest increase, from over \$12,000,000 in 1900 to over \$15,000,000 in 1901, or over 26 per cent. Sandstone increased from over \$7,000,000 in 1900 to not far from \$9,000,000 in 1901, about 24 per cent. The marble production increased to \$4,965,699 in 1901, or 16 per cent, and the slate production increased to \$4,787,525 in 1901, about 13 per cent.

THE ELBLIGHT SYSTEM AS APPLIED TO MINING.

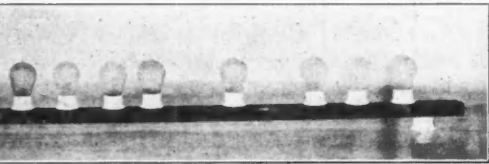
It is not often that apparatus originally designed for decorations and to cater to the luxurious tastes of the idle class is susceptible of practical use in such an industrial occupation as mining. There are exceptions, however, and the Elblight System is one of them, having become more generally used throughout the United States than in England, where it was first exploited. The accompanying illustrations show how the system is applied. In its application to mining, the Elblight System offers the following advantages: The cables can be strung along the galleries of the mine, hung on the projections of rocks or laid along the mine through pools of water, and can be either dragged or carried wherever they may be needed. They can be as easily shifted around as a length of rope. Fumes, dampness and even acids do not affect the cables. All the miner needs to do when he wants a light at any point is to at-

tach a lamp to the cables in the manner shown. He can put in as many as he likes, move them from place to place as frequently as he pleases, with little more effort than that required to put a pin into a pin cushion. In operation, all metallic parts are buried in water-proof and acid-proof compounds, so that there are no disintegrating of contact points possible, and with ordinary care the material is said to last indefinitely. The great drawback in the use of sockets is that the metallic contact points between



METHOD OF ATTACHING ELBLIGHT LAMPS.

the lamps and socket cannot be perfectly protected against the action of acid waters, gases and dampness; whereas, as stated above, in the Elblight System the makers claim that there is nothing exposed to external action except the glass, the porcelain and the insulating compounds. The higher first cost of Elblight material is claimed to be soon compensated for by a large saving in time and labor. Where this is not the case, the manufacturers say it would still



ATTACHING ELBLIGHT LAMPS TO CABLE.

tions was a single lamp broken nor a single fuse blown. The system commends itself for general lighting in railroad tunnels where ordinary electrical apparatus is rapidly disintegrated by the gases that prevail in such places. It also commends itself for general illumination in factories and laboratories where deleterious gases exist. The Elblight System is claimed to overcome all difficulties encountered in electrical illuminating either for decorative or practical purposes.

"INDUSTRIAL" RAILWAY EQUIPMENT OF THE NEW WESTINGHOUSE WORKS.

The new works of the Westinghouse Electric and Manufacturing Company, at Wilmerding, Pa., contain some of the latest and best features of shop engineering. No trouble or expense has been spared to arrange and equip the entire plant so that the movement of work shall be in a continuous straight line, and in logical order from the time the raw material leaves the store rooms until it becomes a finished product. The best facilities for handling and transporting material have been introduced, which makes the plant a model for future manufacturing establishments.

In the main aisles the large traveling cranes take care of all parts, large and small, but the greater area outside the range of the cranes are covered by some more flexible means of transportation. A complete equipment of "industrial" railway connects the various bays, departments, yards and buildings, and brings all pieces of heavy work within range of the cranes and hoists.

The track consists of 20-lb. rails riveted to pressed steel ties. Within the buildings a guard rail is riveted outside the rail, just sufficient space being left to allow for the flange of the wheel. By this arrangement the concrete floors can be laid even with the rail heads, and little or no obstruction is offered on the surface.

An interesting co-ordination of the industrial railway and the standard gauge railroad is shown by Figs. 1 and 2. The railroad passes down the center of the main aisles, and in order to reduce the space reserved for transportation to a minimum it was necessary to run the narrow gauge track within the other. A feature worthy of special mention is the crossing of the standard gauge track by the industrial railway without grooving or interfering with the rails in any way.

This is made possible by the design of the industrial railway cars and cross-overs which throw the weight carried by the wheels from the tread to the flange, and enables them to pass over the rail without jumping the track.

The gauge of the industrial railway is 21½ inches, and the curves are of 12 feet radius, so that little valuable shop floor space is occupied, and the track can be extended into any place where it is desirable to move any bulky parts. Crossings, ball-bearing turntables and switches of every description make any reasonable arrangement possible with this narrow railway. All these parts, as well as track sections 20 feet in length, are made up, and need only to be bolted together with the fish plates to form a complete railway. The simplicity and rapidity of laying this made-up track is most convenient and economical, especially when it is desirable to complete the work quickly.

In the Westinghouse shops only flat top cars of 4 and 8 wheels and from ½ to 10-ton capacity are used, but cars adapted to handle any kind of material, solid or liquid, can be furnished. Roller bearings on the cars reduce to a minimum the amount of power required to handle the loaded car from one place to another. The cars have a flexible wheel base, the axles taking a radial position on a curve, the wheels and the radius of the curve being proportioned to avoid slipping on the rails and the waste of energy in friction. The arrangement of the wheel flanges on the outside makes it possible to round the short radius curves easily, although on a straight track it is immaterial whether the flanges are inside or outside. This variation from ordinary railway practice makes no difference whatever in the operation of the cars or the general construction of the railway except that the curves, switches and frogs must be especially arranged to suit wheels with outside flanges. In applying these principles the outer rail around the curve is made of a special form for the wheel to run on the flange instead of the tread. The axle bearings are pivoted in the center between the wheels, permitting them to take a radial position.

If the cars and loads are small, one man, or at the most, two men, can push them from one part of the shop to another. If there are grades about the plant or large quantities of heavy material to be moved, greater power is required. The storage battery electric locomotive is a good motive power for this purpose. The illustration of one now in service in the Westinghouse plant gives a good idea of the form and arrangement of the locomotive.

The locomotive is carried on two swiveling trucks, with every wheel a driver, giving a maximum tractive effort, and enabling it to draw large loads and ascend heavy grades. It runs smoothly around

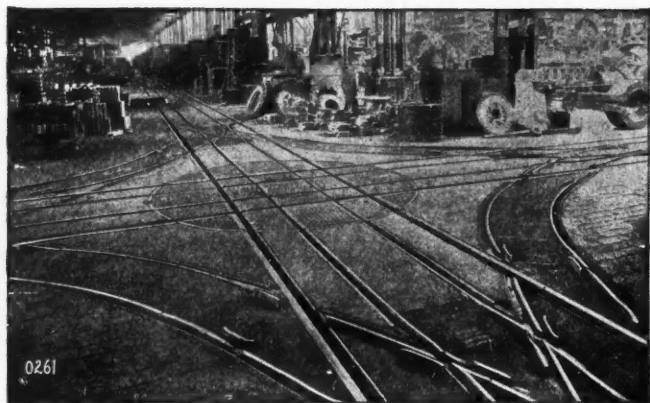


FIG. 1. CO-ORDINATION OF INDUSTRIAL AND STANDARD RAILWAY TRACKS.

curves of 12-foot radius, so that all parts of the works are accessible to the railway and locomotive.

Two Westinghouse vehicle type motors are mounted, one driving each truck, and these are so exactly proportioned to the normal output of the batteries and the weight of the locomotive that they are not and can not be overloaded by the motorman. One of these locomotives is capable of hauling about 50 tons on the level and a corresponding load on grades.

The advantages claimed for this type of locomotive are: It is always ready for use night or day;

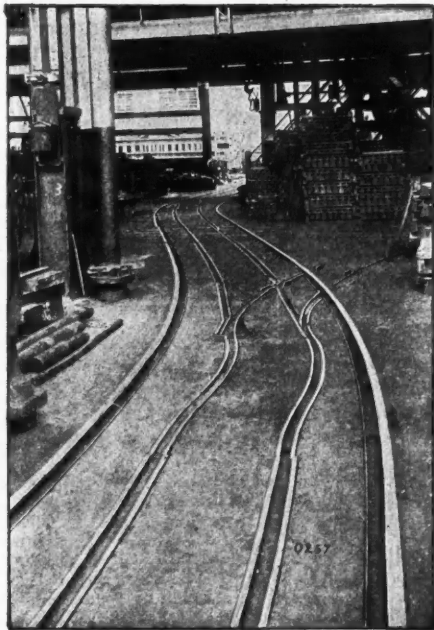


FIG. 2. INDUSTRIAL RAILWAY TRACKS, INSIDE STANDARD GAUGE.

an ordinary workman without technical knowledge can operate the locomotive and charge the batteries. The motors are iron clad, the gear cases enclosed in an oil tight case; the battery, controller, etc., are thoroughly protected from injury; no expense is incurred when not in operation; no trolley wires or return current with attending fire risk, and the locomotive is wholly self-contained. Two of these electric locomotives were recently furnished to the Westinghouse Electric and Manufacturing Company by the C. W. Hunt Company, New York, which company

also supplied the industrial railway and all its equipment.

PATENTS RELATING TO MINING AND METALLURGY

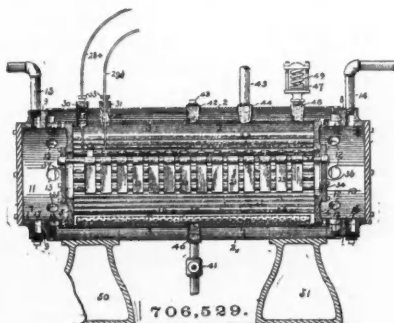
UNITED STATES.

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

Week ending August 12, 1902.

706,513. MACHINE FOR MAKING TUBULAR TOOL-SHANKS.—Franklin P. Bates, Indianapolis, Ind., assignor

to the Indianapolis Drop Forging Company, Indianapolis, Ind., a corporation of Indiana. The combination, in a machine for making tubular structures, of the reciprocating internal die or mandrel, a lower die composed of rollers surrounding the opening through which the metal is to be forced the faces whereof form the outside shape of the hollow structure being made, the several rollers being arranged in the same plane with their adjacent edges adapted to operate in close touch with each other, and adjustable supports in which the rollers are mounted.



706,529. ELECTROCHEMICAL APPARATUS.—Chauncey C. Clark, Philadelphia, Pa., assignor of one-half to James G. Carson, Philadelphia, Pa. An apparatus having two cylinders, one surrounding the other, and an inclosed space between the cylinders, a chamber at each end of the cylinders, means of communication from each chamber to the space between the cylinders, a fluid-inlet to one chamber, a fluid-outlet from the other chamber, means of communication from chamber to chamber through the surrounded cylinder, and a series of electrodes within the cylinder.

706,533. ARTIFICIAL FUEL.—George M. Dallas, Chicago, Ill., assignor of one-half to William R. Chittenden, Chicago, Ill. An artificial fuel, consisting of first treating the culm or coal dust to a temperature which will raise it to the point of ignition, and afterward mixing the heated dust with a mixture composed of fifty gallons of paraffin residuum, ten pounds borax, twenty-five pounds antimony, three pounds acetic acid, one peck oil-cake meal, two hundred pounds clay, five pounds crude potash boiled in thirty gallons water, twenty-five pounds salt, to twenty-five tons of coal dust.

706,546. SQUARE SHAKING-GRATE.—Frank W. Foster, Melrose, Mass.—A rocking grate with notched side frames, a notched rocker bar, the side frames and rocker bar mutually embraced by the notches in the rocker bar and side frames, respectively, the side-frame notches being wider than the rocker bar is thick, to give play to the rocker bar to rock in side-frame notches, the sides of the notches serving as stops to the rocker-bar motion.

706,553. PROCESS OF MANUFACTURING ALUMINA.—Charles M. Hall, Niagara Falls, N. Y. A method of purifying bauxite or other impure oxide of aluminum, which consists in heating the same in admixture with a reducing

agent by means of an electric current without substantial fusion, thereby reducing the contained impurities in whole or in part, removing the mass so treated and afterward fusing it in an electric furnace and causing the impurities to agglomerate.

706,600. CARBURETER.—John Rush, Waterloo, Iowa. A carbureter for gas machines, with a mixing tank having an oil inlet and gas outlet; of an air-inlet pipe entering the tank above the level of the gasoline, and a number of small tubes communicating with and depending from the pipe into the gasoline and each pierced with minute perforations.

706,756. ORE-ROASTING FURNACE.—Daniel C. Jackling, Republic, Wash. An ore-roasting furnace, comprising an ore-roasting hearth, a cooling hearth arranged parallel with and above the ore-roasting hearth, tracks arranged parallel

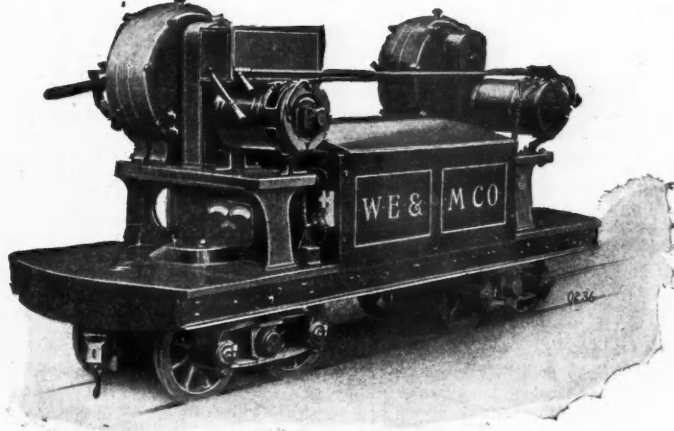
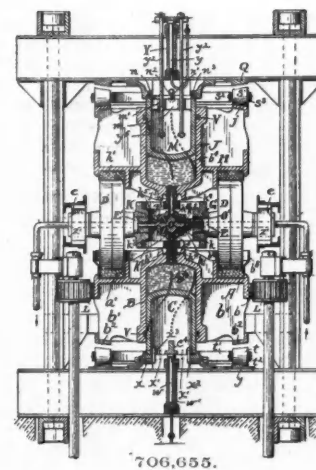


FIG. 3. ELECTRIC STORAGE BATTERY LOCOMOTIVE.

with and outside of both such hearths, and means for supporting the track mechanism and cooling hearth independently of the roasting hearth.

706,760. HYDRAULIC FIREPROOF CEMENT.—William R. Knox, Newark, N. J. An improved hydraulic cement, comprising the following ingredients necessary to produce one hundred pounds of cement, viz.: silica, twenty-four pounds; alumina, six and one-half pounds; magnesia, five pounds; lime, sixty pounds; muriatic acid, three pounds; iron oxide, one and one-half pounds.

706,793. ORE-CONCENTRATOR.—Howard S. Bailey and William E. Wild, Denver, Colo. An ore-concentrator having a reciprocating table, containing a plurality of ore-pulp receiving recesses of equal lengths, width and depth; a



plurality of ridges or dams extending across said ore-pulp receiving recesses, also of equal lengths; a plurality of concentrates washing and classifying portions below the dams, also of equal lengths, the recesses and the dams being arranged in a line at right angles to the length of the table, and means for feeding ore-pulp into and across the recesses.

706,655. CRUSHING AND PULVERIZING MACHINE.—Ludwig Herman, Cleveland, O. A machine having the combination of a fixed cylindrical piston, a cylinder rotatively mounted thereon, means for admitting a fluid under pressure into said cylinder, a table secured to said cylinder, and rotatable crushing wheels bearing upon the table, and means for yieldingly pressing the table and crushing wheels against each other.

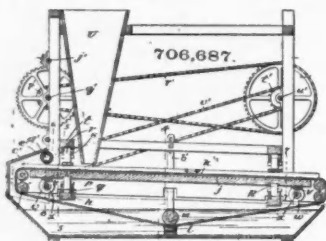
706,663. DUMP CAR.—Frank S. Ingoldsby, St. Louis, Mo. A dump car having a hinged door, a shield carried thereby and extending over the hinge of the door, and a cooperating member with which the shield abuts when the door is closed, combined with straps carried by the door, and beveled hooks carried by the car body and adapted to

engage such straps to force the shield into contact with the co-operating member.

706,671. **ELECTRIC ROAD-GRADING MACHINE.**—John W. Langfitt, Adel, Iowa. A machine for grading roads, having a carriage frame mounted upon an axle, with traction wheels on its ends and a steering wheel at the end and center of the frame and plows adjustably connected with the carriage to advance at the sides of the carriage, means for moving the plows laterally at the front and rear ends of the beams, and means for raising and lowering the plows.

706,674. **MACHINE FOR ROLLING CAR WHEELS.**—Henrik V. Loss, Philadelphia, Pa., assignor to Charles T. Schoen, Philadelphia, Pa. A machine for rolling car wheels, comprising a carriage having a horizontal spindle upon which the work is supported in a vertical position, a pair of converging rolls adapted to shape the wheel between its hub and rim, rolls adapted to shape the flanged tread of the wheel, and complementary lateral edge rolls, combined with power appliances for driving the converging rolls positively, independent means for moving positively both of said converging rolls into and out of position and for retaining them in position, independent means for moving the tread-rolls into and out of position, and independent means for moving the edge rolls into and out of position.

706,687. **VANNER.**—Cyrus C. Pratt, Portland, Ore., assignor of one-half to Thomas Holland, Portland, Ore. A machine having the combination of a water tank, arranged in a suitable frame, lower and upper antifriction rollers, also arranged in said frame, an oscillatory jigger interposed

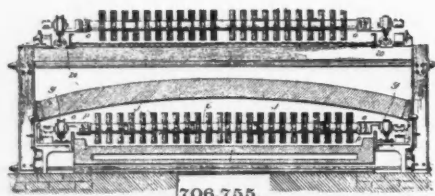


between said lower and upper rollers, and having antifriction rollers on its under side, transverse shafts having oppositely disposed cam wheels arranged between and engaging the antifriction rollers at the under side of the jigger, means for rotating the said shafts, a brush disposed in the tank, a roller adjustable toward and from the brush, an endless corrugated belt having its upper stretch disposed above the jigger and its lower stretch passed through the tank and between the brush and roller, means for moving said belt, a pipe having openings, and a covering of wire gauze for supplying water in a finely-divided state to the upper stretch of the belt, and a hopper disposed above said upper stretch of the belt.

706,688. **FLUID PRESSURE OPERATED TOOL.**—John V. W. Reynders and Willard T. Sears, Harrisburg, Pa. The combination of a liquid reservoir, a cylinder containing a piston, a tool operatively connected to said piston, means whereby fluid pressure may be exerted upon the liquid in the reservoir or upon the piston at will, and a conduit connecting the reservoir and the cylinder, the conduit being provided with mechanism permitting free flow of fluid in one direction, but restricting said flow when the liquid moves in an opposite direction.

706,701. **METHOD OF IMPACTING ONE METAL UPON ANOTHER.**—Samuel H. Thurston, Long Branch, N. J. A method of providing a metal article with a coating of another metal, which consists in forcing particles of the coating metal by a blast of a gas against the article with such force as to cause the particles to become embedded in the surface of the said article and form a permanent coating thereon.

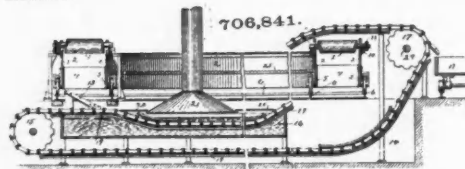
706,755. **RABBLE CARRIAGE.**—Daniel C. Jackling, Republic, Wash. A rabble carriage, having the combination of a body portion provided with a pair of bars extending longitudinally thereof, a pair of wheel washers secured in



position between the ends of the pair of bars to form a ball raceway, an annular wheel rim surrounding such washers and completing the raceway, and a plurality of antifriction balls interposed between the washer and wheel rim.

706,841. **CASTING APPARATUS.**—Patrick Meehan, Lowellville, O. A casting machine having a combination with a series of open molds, of a trough or spout for conveying molten metal to the molds without permitting the molten metal to contact with the mold carrier, means for moving the molds adjacent to the trough or spout, and

mechanism controlled by the moving part of the machine for periodically checking the flow of the metal to the machine.



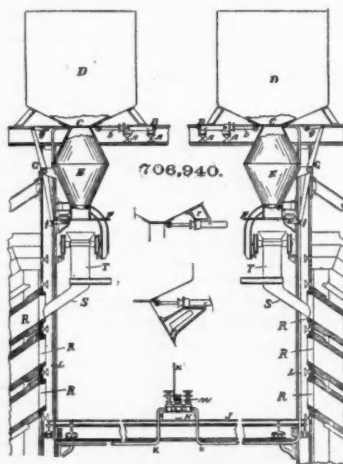
706,872. **DRILL-ROD GRAB.**—James H. Adams, Fullerton, Cal. A drill-rod grab with a suitable casing, a rigid jaw contained therein, a coinciding sliding jaw arranged adjacent the rigid jaw and provided with a plurality of impinging teeth, the engaging surface of the jaw being wedge-shaped, and means for not normally holding said sliding jaw against an upward movement.

706,916. **FUEL VALVE FOR GAS ENGINES.**—Jess B. Fenner, Buffalo, N. Y., assignor to the J. W. Ruger Manufacturing Company, Buffalo, N. Y. The combination with the cylinder and the piston therein of a chest arranged at the end of the cylinder and having a valve chamber communicating with the cylinder, a socket extending from the outer side of the chest into the valve chamber, and a fuel conduit opening into the side of the socket; a valve-case fitting in the socket and having ports in its side which communicate with said fuel conduit, and a hollow rock valve arranged in said case and having ports in its side which register with the ports of the case and opening at its inner end into the valve chamber of the chest.

706,917. **SPLIT PULLEY.**—Hosea W. Finch, Tacoma, Wash. A split pulley having in combination segment rims provided with cross-arms or spokes, each having a recess at its inner side, for the two-part box or hub fitting between the arms in the recesses thereof and having registering bolt holes, said parts also having transverse recesses in their contiguous sides for the shaft and one of the parts further recessed centrally; a metal casing seated in the said central recess and provided with an eccentrically-curved wall terminating at one end in a straight wall, said casing being also provided with a flange projecting from the open end thereof and provided with holes registering with the aforesaid bolt holes in the hub.

706,939. **GAS PRODUCER.**—James A. Herrick, Philadelphia, Pa. A gas producer open at the bottom for the direct downward discharge of ashes and having in the lower portion of the same a series of blast boxes which do not extend outwardly to the lining of the producer so as to provide for the descent of ashes and clinkers between the lining and the outer ends of the blast boxes.

706,940. **MECHANISM FOR MEASURING COAL TO GAS RETORTS.**—Walter R. Herring, Edinburgh, Scotland. The combination of the hoppers D, measuring chambers E, coupled slides C and F, hydraulic cylinders B having piston



rods b connected with the respective slides C, suitable conducting chutes beneath the measuring chambers for conveying the charges of coal therefrom to the several retorts; actuating valves 1, 2, 3, etc., and conducting pipes L for supplying fluid under pressure to the cylinders B in succession.

706,965. **APPARATUS FOR CALCINING PLASTER.**—Ambrose Lawrence, Acme, Tex. An apparatus for calcining plaster, comprising a ventilative shaft open for the admission of air, a revoluble drum mounted loosely on the shaft, means for locking the shaft against rotation and for making the shaft fast with the drum to rotate therewith, and means for interrupting the direct circulation of air through the shaft.

706,972. **APPARATUS FOR THE PRODUCTION OF PURE CARBONIC ACID GAS FROM CARBONATES IN A CONTINUOUS MANNER.**—Eduard Luhmann, Munster, Germany. An apparatus in combination with a shaft furnace for the reception of the carbonate to be treated, of an auxiliary heating furnace having a coil arranged therein, a fan, a pipe leading from the top of the shaft fur-

nace to said fan, a jacket circumferentially arranged in the lower end of the shaft furnace, a pipe leading from the fan to one end of the jacket, a pipe leading from the other end of the jacket to the coil, and a pipe leading from the other end of the coil to the lower part of the furnace, a condenser and a pipe arranged to withdraw a portion of the gas as it is discharged from the fan and lead it to the condenser.

706,993 and 706,944. **ROD-ROLLING MILL.**—Charles A. Nighman, Jersey City, N. J. A rod-rolling mill having, in combination, a set of rolls having their pass-forming grooves constructed with rib-forming enlargements, a guide, conformed internally to the continuously-ribbed rod so produced, arranged to receive the ribbed rod as it issues from said rolls and to prevent any twisting thereof, and a set of finishing rolls arranged to receive the ribbed rod from said guide and to roll the ribs into the body of the rod.

707,001. **HYDROCARBON BURNER.**—Charles T. Pepper, Los Angeles, Cal., assignor to Charles F. Pepper, Los Angeles, Cal. A hydrocarbon burner comprising a flame spreader on the end of the fuel-supply pipe; a combustion cup disposed below the flame spreader, said cup having a central draft opening in the bottom thereof, a perforated conical-shaped fuel spreader in said cup having legs to hold it elevated above the bottom of the cup.

707,003. **ROTARY ENGINE.**—James P. Pollard, Silver Lake, Wash. A rotary engine having a combination of a shell or casing, a piston concentrically mounted therein and having an annular chamber communicating with radial pockets, wings mounted in the pockets and having abutments and blades dividing the pockets and movably extending into the body of the piston at a distance inward from the inner terminals of the pockets, and means for supplying a motive agent to the said chamber and the compartments formed between the wings.

707,035. **METAL-WORKING TOOL.**—Adam Tindel, Philadelphia, Pa., assignor to Tindel-Morris Company, Eddystone, Pa., a corporation of Pennsylvania. A cutter head having cutter-receiving grooves in the face of the same, an annular groove transverse to the cutter-receiving grooves, and openings extending from the base of the annular groove to the back of the cutter head, a series of cutters adapted to the cutter grooves, and cutter-securing bolts having heads overlapping the cutters and adapted to the annular groove in the face of the cutter head, the stems of the bolts passing through the openings in the cutter head.

707,016. **METAL-BORING MACHINE.**—Charles C. Roberts, Ansonia, Conn. A boring machine having a pair of cutter heads operating toward each other, and means carried by one of the cutter heads and operated by the other cutter head for discontinuing the operation of one of the cutter heads.

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 17, 1902.

6,077 of 1901. **GALVANIZING ROLLS.**—R. Heathfield, London. Improved rolls for use in galvanizing tanks.

14,746 of 1901. **OXY-HYDROGEN BURNER.**—Coln-Musener Bergwerks, Creuzthal, Germany. An oxy-hydrogen flame for melting and removing the slags from blast furnaces.

14,576 of 1901. **ELECTRIC FURNACE.**—Societe Electrometallurgique Francaise, Froges, France. In electric furnaces for smelting iron ores, arrangements for reducing the amount of carbon required.

15,595 of 1901. **PURIFYING BLAST FURNACE GASES.**—B. H. Thwaite, London. Improved cooling and purifying apparatus for blast furnace gases.

15,751 of 1901. **COKE OVEN.**—F. J. Collin, Dortmund, Germany. Improved arrangements of gas passages in the inventor's coke ovens.

17,319 of 1901. **WELDING STEEL.**—J. E. Goldschmid, Frankfurt-on-Main, Germany. Adaptation of water gas flames for welding steel articles such as tubes.

3,357 of 1902. **HARDENING COPPER.**—C. Renstrom, Seattle, Wash., U. S. A. Hardening copper and alloys by heating, sprinkling with sulphur and then immersing in a bath of blue vitriol.

3,865 of 1902.—**DUMP CAR DOOR.**—C. H. Snow, San Francisco, U. S. A. Locking device for the hinged doors of automatic dumping cars.

Week ending July 24, 1902.

15,756 of 1901. F. J. H. Lascelles, Durham.—An improved coal cutter with horizontal and vertical disc cutters, which are dish to allow for clearance.

16,109 of 1901. J. R. Down and J. Godfrey, Swansea.—A roasting furnace with fixed upper hearth and revolving lower hearth.

8,883 of 1902. Compressed Air Machinery Company, San Francisco.—A rock drill adapted for giving either long blows or short rapid ones.

10,857 of 1902. J. F. Willecox, Cleveland, O.—A coal rammer for compressing coal before coking.

PERSONAL.

Mr. G. T. Rives is examining mining property near Guayamas, Mex.

Mr. W. D. Parker is the new manager of the Ophir Mine, Stateline, Utah.

Mr. Robert Mein, secretary of the Alaska-Juneau Mining Company, is in Juneau.

Mr. H. A. Keller recently returned to San Francisco, Cal., from Valdez, Alaska.

Mr. C. L. Dignowity, of New York, has been visiting Salt Lake and other places in Utah.

Mr. Charles H. Wittenoon, of West Australia, is visiting the Colorado mining regions.

Mr. Alexander Baring, of London, Eng., has been visiting the North Pole Mine, Sumpter, Oregon.

Mr. Gaston Schwab of Bienne, Switzerland, was a visitor to the mines of Gilpin County recently.

Mr. A. Mazze has succeeded Mr. H. D. Trennam as superintendent of the Stockton Mine, Stockton, Utah.

Mr. Theodore Schwartz recently left Denver, Colo., for Tucson, Ariz., on professional engagements.

Mr. F. O. Harvey, mining engineer, started from London recently on a professional trip to the United States.

Mr. C. E. Darmours, of Virginia City, Mont., has returned from a trip to the Thunder Mountain country, in Idaho.

Mr. George D. B. Bonbright on July 1 retired from the firm of William P. Bonbright & Co., of Colorado Springs, Colo.

Messrs. John Benzie and J. M. Shrote of the Benzie Investment Company, have been visiting mines near Central City, Colo.

Mr. J. M. Morrison, manager of the Richfield Mining Company, recently returned to Ures, Mexico, from Washington, D. C.

Mr. J. O. Roundtree has returned to Baker City, Ore., and taken charge of the Baker City Sampling Works as manager.

Dr. J. W. Smith, of Baltimore, Md., who is interested in property in Gilpin County, Colo., is making a visit to that district.

Mr. Walter Douglas, superintendent of the Copper Queen Mines, Bisbee, Ariz., has been to New York City on a business trip.

Mr. Harold Rickard is now at Newquarry, Cornwall, Eng., where he is recovering from fever contracted on the west coast of Africa.

Mr. C. H. White, professor of geology and mineralogy of Yale University, has been at Mercur, Utah, to investigate cyaniding work.

Messrs. Samuel and Phillip Conkling and John Madeira, of Philadelphia, Pa., visited the mines and mills in Gilpin County, Colo., last week.

Mr. F. Coulthard, of London, returned to that city recently after filling a professional engagement with the Tharsis Sulphur and Copper Company.

Mr. Robert Rutledge, of St. Louis, Mo., part owner of the Charter Oak Mine in Russell District, Gilpin County, Colo., was a visitor there recently.

Capt. Richard Edwards of the Osceola Mine, was injured August 23, as a result of an explosion of two boxes of caps at the storehouse at Houghton, Mich.

Mr. A. Hiorns has been appointed mine manager to the Kwandang-Soemalata Mining Company, at Soemalata, North Celebes, and has left London for his new post.

Mr. J. W. Miller, of Pittsburg, Pa., has been visiting mines in Beaver County, Utah, in company with Messrs. Marcus E. Jones and L. H. Beason, of Salt Lake.

Mr. M. G. Grebe, of Lincoln, Neb., a stockholder in the Hillside Mining Company, operating near Central City, Colo., was in this district recently to look after his interests.

Mr. J. M. Hyde has resigned as curator of the mining exhibit and museum of the California Mining Bureau, in San Francisco, Cal., and is succeeded by Mr. C. W. Cline.

Count J. de Gabriac, of Paris, France, one of the directors of the La Grange Hydraulic Gold Mining Company, of California, who has been visiting the mine, has returned to Paris.

Colonel Frank J. Hearne, president of the National Tube Company, has resigned on account of failing health. First Vice-President William B. Schiller has been elected president.

Mr. Reese M. Ling has resigned as president and general manager of the McCabe Extension Company of Arizona. Dr. J. Bradford, of Chicago, who has been elected to the position, is now in Prescott, Ariz.

Mr. Frank L. Nason has accepted a position as consulting engineer of the Ringwood Iron Company and the Basic Ore Company, both controlled by Hon.

Abram S. Hewitt. The properties are in Passaic County, N. J.

Messrs. F. W. Smith and D. W. Barnes, of Valparaiso, Neb., and W. A. Rogers, of Omaha, Neb., stockholders in the Electric Spark Gold Mining Company operating in Gilpin County, Colo., were visitors at Black Hawk recently.

Mr. James W. Neill, of Salt Lake, Utah, has been appointed consulting engineer of the California Mining Company, of Utah, and will make a thorough examination of the property with a view to deciding upon the best methods of mining and treating the ore.

Mr. N. J. Martin, who has for the past 3 years been in Honduras, has resigned his position as superintendent of the mines of the New York & Honduras Rosario Mining Company, at San Juancito, and is spending a few weeks at his home at Lewiston, Idaho.

Mr. H. J. Lawrence, traffic manager of the Pittsburg Coal Company, recently resigned his position to engage in business for himself. He will be succeeded by Samuel P. Woodsides, for 15 years general agent of the Erie Railroad, with headquarters in Pittsburg.

Dr. J. F. Newson, professor of mining at Stanford University, will go to Europe in September, and will return to his university work in January next. He expects to visit the principal mining districts and mining schools of Great Britain and the Continent during his absence.

Mr. Louis Faithorn, assistant general freight agent Chicago & Alton Railway, Chicago, has resigned to take a position as traffic manager of the DuPont Powder Company, of Wilmington, Del. Mr. C. A. King, division freight agent at Marshall, Mo., takes Mr. Faithorn's position at Chicago.

Messrs. William P. Bonbright & Co., of Colorado Springs, Colo., announce that they have opened a branch office at 15 Wall street, New York, in the personal charge of Mr. William P. Bonbright. While facilitating the conduct of their general business and extending its scope, the New York branch has been established more especially for the presentation of high-class investment opportunities and for European operations through the London house.

OBITUARY.

William Hooper, of Ticonderoga, N. Y., who died recently of heart disease, was superintendent of the American Graphite Company. He was a man of much ability as a mechanical engineer, and invented a slimer for separating graphite and the Hooper dry concentrator.

William Fleming, of Oil City, Pa., died suddenly in Cincinnati, O., August 23. He was born in Indiana County, Pa., and resided there until 1861, when he enlisted in the army, serving until 1864. He then settled in Oil City, where he engaged in business for a short time, but later terminated that connection, and in partnership with C. N. Payne and others commenced operations in the oil-fields which were then being opened. He owned at one time a number of wells in Butler County, and in the Bradford field as well as around Oil City. In 1886, after operating very successfully, he became identified with the Standard Oil Company. He was at first employed in a consulting capacity, but later became vice-president and manager of the Ohio Oil Company, a branch of the Standard's interests. This position he held until a few months ago, when he resigned on account of his health. For some time past he had been traveling, in hopes of securing some benefit. He leaves a widow, three daughters and a son. Mr. Fleming's judgment was highly regarded by his associates and by the company, and few men were more thoroughly acquainted with all the developments of the petroleum business.

Albert Lackey, who died at his home in Oakland, Cal., August 15, had been connected with the management of the Comstock mines for 41 years and was one of the most prominent Masons on the Pacific Coast. The cause of death was pleuro-pneumonia. Mr. Lackey had been superintendent of the Overman and Caledonia mines at Gold Hill, Nev., for 22 years, up to a year ago, when he retired owing to ill health. Born at Youngstown, O., in 1836, he went to Virginia City in 1860 and was first employed as a carpenter and timberman. He framed the first set of timbers that was used in the Ophir Mine, cutting them from trees on the slope of Mount Davidson. He was foreman of the Gould & Curry Mine at the time of the first great fire in that property, and went down into the shaft at the risk of his life and rescued a number of miners caught by the flames and smoke. He was also active in saving lives at the Yellow Jacket and Belcher fires. Afterwards, becoming superintendent of the Overman and Caledonia mines, he remained in charge of those properties until November, 1901, when he retired to live with his family at Oakland. He was a man of great executive ability and a thoroughly practical miner.

Jacob Oliver Roads, who died at his home in Potts-

ville, Pa., August 18, was born in Maiden Creek Township, Berks County, Pa., January 1, 1817. He was employed as a clerk in a general store at Hamburg, Berks County, until he approached manhood. He went to Pottsville in 1842, and was employed by Enoch W. McGinnes, then operating a colliery within the limits of the borough. After being with Mr. McGinnes for a number of years, he was employed by Burd S. Patterson, as general manager of his colliery at New Philadelphia. In 1848, with the late Colonel James J. Connor and William Littlehales, who was afterward shot by the Molly Maguires, he formed the partnership of Connor, Roads & Littlehales, and operated with success the Novelty Mine at New Philadelphia for six years. In 1854, in partnership with Gustavus G. Schollenberger, trading as Roads & Schollenberger, he continued this operation, meeting with a reverse in 1856, during the panic of that time. In 1855 he moved from Pottsville to Tamaqua and operated the Windy Harbor mines, accepting in 1858 the superintendency of the two collieries owned by Miller & Fisher, known as the Warrington and Novelty collieries. In 1861, with A. C. Miller, of Philadelphia, and Michael F. Maize, trading as A. C. Miller & Co., Mr. Roads took a lease on the Jones tract on which part of the town of Shenandoah was subsequently built. This was the pioneer colliery of that region, and is still in operation under the management of the Reading Company. The records of this colliery will show the cost of the coal to be as low as any of its size, capacity and conditions in the Southern anthracite fields and with almost an admirable record in ventilation, a subject on which Mr. Roads was expert. In 1865 he and his partners were offered \$450,000 for this plant, which was refused, but a few years, subsequently owing to the fall in the price of coal, contests with the railroad company concerning cars and labor troubles, the firm was forced into liquidation. About this time Mr. Miller died, leaving the burden of paying a debt of about \$75,000 due creditors of the firm upon Mr. Roads, who spent many years before he finally succeeded in paying every dollar of the firm's debts. Mr. Roads also opened the Stroh tract in Reilly, and the Mitchell in Rush township, demonstrating the presence of workable coal in territory previously condemned, and on such points his advice was frequently sought by younger and less experienced operators, and always cheerfully given. Mr. Roads in 1833 married Mary Mackey Roseberry. Five children survive him—Elena, at home; Mrs. Dr. B. C. Guldin, Mrs. Thomas F. Downing, George M. Roads, and Jay O. Roads.

SOCIETIES AND TECHNICAL SCHOOLS.

MONTANA SCHOOL OF MINES.—The trustees at a recent meeting appropriated \$1,000 for the purchase of a testing machine for the mechanical laboratory.

THAMES SCHOOL OF MINES.—F. B. Allen has resigned as director of this institution in New Zealand, having been offered an important position in Western Australia. Mr. Allen has, during the past 6 years, ably discharged his duties, and his departure is a serious loss. A. H. V. Morgan, chief assistant, has been temporarily appointed director.

HARVARD UNIVERSITY.—A party of 11 young men, members of the class of 1903 of the mining department of the Lawrence Scientific School are on one of their summer courses, studying mining operations throughout the principal camps of Colorado. They were at Idaho Springs, Colo., last week. The party is in charge of Prof. G. S. Raymer, instructor of mining.

STATE COLLEGE OF KENTUCKY.—This institution, which has recently added a department of mining engineering to its curriculum, has sent out circular letters calling attention to this new branch of study and asking for aid and co-operation. The assistance asked is not in the way of cash donations, but materials and illustrations. The department having been so recently organized (the first session for juniors opens next September), it needs all the illustrative material that can be obtained. Blue-prints (or copies thereof) and tracings of plans relating to mine plant (surface and underground), to ore dressing and milling plants, etc., are badly needed, and the college authorities will greatly appreciate the favor. The donations will be appropriately acknowledged in the college catalogue. Plans of tipples, screens, haulage arrangements, ventilating machines, washing and coke plants, concentrating and metallurgical machinery, gold mills, drilling machinery, excavating machinery of various sorts (including dredges), drawings, photographs and plans relating to mine plant generally, the getting, handling and treatment of product, are also greatly desired.

The college is doing all it can to have such material prepared, but the expense and difficulties of obtaining an adequate collection in such a way within a reasonably short time are beyond its ability. Complete sets of the catalogues issued by makers of mining machinery, etc., are also requested.

Plans and other material received will be used only for purposes of instruction, and will not be allowed to

leave the college. Postage and expressage will be refunded.

The establishment of this department was authorized by the act of the General Assembly, session of 1898. The course is laid out with the design of affording the student a thoroughly good foundation for professional work in mining, metallurgy, assaying and geology, and of so preparing him that he may readily and quickly assimilate that knowledge of the details of practice which may only be gained through experience. The course is rendered as practical as the limitations of college instruction permit. The effort is made to acquaint the student not only with the methods of mining and mine management in particular, but to give him such instruction in mechanical and civil engineering as the demands upon the modern mining engineer now require. The course for the first two years, therefore, closely follows those of the departments of mechanical and civil engineering, while both departments are also drawn upon in the junior and senior years. The college is well situated with reference to the practical study of both coal and metal mining, there being within the State iron, coal, lead and zinc, spar and clay mines, within easy reach of Lexington, while the copper mines of Tennessee, the iron mines of Virginia and Alabama, and the gold mining regions of Alabama and Georgia may be reached within 24 hours or less of travel.

The department of mining engineering is presided over by Prof. C. J. Norwood, Dean, whose excellent work as curator of the Museum of Geology and State Inspector of Mines, is well known.

INDUSTRIAL NOTES.

The big power house of the West Allis, Wis., plant of the Allis-Chalmers Company is now in use.

The new blast furnace of the North Side Iron Company, with a capacity of 18,000 tons of bessemer iron, was put in operation at Sharpsville, Pa., recently.

A charter has been issued for the Clearfield Steel and Iron Company, which has begun the erection of a plant at Clearfield, Pa., for the purpose of manufacturing steel.

The plant of the Pittsburg Tool Steel Wire Company, at Colonia, Pa., has been put in partial operation. The entire plant will be completed and ready for operation soon.

Pittsburg papers report that Arthur R. May, acting for the American Sheet Steel Company, has bought the James Ryan and John Booth properties at McKeesport, Pa., directly adjoining the W. Dewees Wood plant.

The Detroit Copper Mining Company, Morenci, Ariz., has just ordered two 50-gal. Cross oil filters from the Burt Manufacturing Company, of Akron, O., making 10 of these filters now in use at the Detroit mines and works.

The Pennsylvania Iron Works Company, Philadelphia, has been awarded the contract, through its Pittsburg representative, for a 32 by 54 by 48-in. cross compound non-condensing engine for the Lucy furnaces of the Carnegie steel plant.

The New Jersey Zinc Company is erecting a furnace at Palmerton, Carbon County, Pa., that will be 60 by 14 ft., and will be ready early in 1903. It will have a capacity of 20,000 tons annually of spiegel-eisen from zinc residuum.

The American Air Compressor Works, through its New York City office, under the management of General Sales Agent Vail, has received a cable order from Russia for two large high-pressure air compressors for pumping water.

The Pittsburg Valve and Fittings Company is building new works at Barberton, O., and has placed a contract with the Westinghouse Electric and Manufacturing Company for the electrical equipment which includes generators, motors and switchboards.

The Jessop Steel Company, of England, is building a large steel plant at Washington, Pa., in which electrical power distribution will be employed. The company has recently purchased a considerable amount of direct-current apparatus from the Westinghouse Electric and Manufacturing Company.

The Ashton Fire Brick and Tile Company, of Salt Lake, has among recent customers the Highland Boy Mining Company and Bingham Consolidated Mining Company, Bingham, Utah; Black Forest Mine, Spruce Mountain, Nev.; Mine and Smelter Supply Company and the Union Foundry and Machine Company.

At the annual meeting of the stockholders of the Dover Iron Company, held in Dover, N. J., recently, the old board of directors was re-elected, as follows: John Kean, of Elizabeth; Mahlon Pitney, of Morris-town; Frederick A. Potts, of New York; H. S. Little, of Trenton, and Albert Richards, of Dover. Mr. Pitney was re-elected president of the board and Henry W. Crabbe, secretary and treasurer.

The Philip Carey Manufacturing Company, of Lockland, Ohio, has secured the contract to furnish

and apply the 85 per cent carbonate of magnesia pipe covering at the power station of the Manhattan Railway Company, at Seventy-fourth street and East River, New York City. This is one of the largest contracts closed by any pipe covering manufacturer in recent years, and amounts approximately to \$25,000.

The Pittsburg Gauge and Supply Company, of Pittsburg, Pa., is furnishing two 125-h.p. boilers to the Cadiz Electric Light and Power Company, of Cadiz, Ohio, besides giving the power plant a general overhauling, and will supply the Sleepy Eye Milling Company, of Sleepy Eye, Minn., a complete oil filtering system. The Pittsburg Gauge and Supply Company has in press a new general catalogue of some 686 pages, which will be ready for delivery about September 1.

The Consumers' Gypsum Company has been organized with the following officers: President, N. J. Ruggles, Columbus; vice-president, John Eicesor, Pittsburg; secretary, J. G. Powell, Toledo; treasurer, E. J. Forrester, Cleveland; manager, E. H. Fishack, Toledo. Directors, W. M. Holmes, Pittsburg; E. J. Forrester, Cleveland; L. E. Fishack, Toledo; N. J. Ruggles and E. T. Bingham, Columbus; J. W. Eicesor, Pittsburg, and L. G. Powell and E. H. Fishack, Toledo. The company is composed of 4 large plaster concerns in Pittsburg, Columbus and Cleveland. It has purchased the gypsum beds at Port Clinton. These will be in operation January 1, with a capacity of 1,000,000 bags a year.

The Denver Engineering Works Company, of Denver, Colo., has recently shipped complete a 10-stamp mill, including saw mill plant, to R. B. Pratt, of Thomasville, Colo. In this mill will be used one of the new hydraulic classifiers recently developed by the Denver Engineering Works Company from experiments and data obtained by Professor Richards. The company has also begun the shipment of the material for a 40-stamp mill for the Penobscot Mining Company, of Deadwood, S. D. It is reported that by the use of the new spitzkasten recently gotten out by the Denver Engineering Works Company the Gregory-Bobtail Mill, at Black Hawk, Colo., has increased the savings of values from the ore materially.

The C. O. Bartlett & Snow Company, Cleveland, O., was incorporated under the laws of Ohio July 1, 1902, succeeding the firm of C. O. Bartlett & Co., and located on its own property in the center of the city. The manufacturing plant consists of 2 large 3-story brick buildings, with 2 elevators, also one building for structural iron and boiler work and another building for manufacturing and dressing buhr stones, besides abundance of yard room with steam derricks for handling heavy dryers, tanks, boilers and engines. The buildings are fitted up with improved machinery, air compressors with pneumatic drills and hammers, and all driven by a 200-h.p. automatic engine. The company manufactures dryers, elevating and conveying machinery, and other similar machines.

Westinghouse, Church, Kerr & Company have removed their Pittsburg, Pa., office from the first floor of the Westinghouse Building to more commodious quarters on the eighth floor, and have organized two new departments, the engineering and construction departments, in addition to the original sales department, and have now a commodious reception room exclusively for the convenience and entertainment of visitors and patrons. The firm is prepared to give immediate attention to all classes of general engineering and construction work as applied to power and its uses in transportation and industry. It will provide in all cases from its engineering force adequate personal supervision of work in hand, both during construction and subsequent thereto. The office conducts, as formerly, the sales department of the Westinghouse Machine Company, and the increased facilities will enable it to fulfil the most extensive contracts.

TRADE CATALOGUES.

The American Engineering Works, of Chicago, Ill., has issued Circular No. 22, describing a small article which will be found of considerable use in concentrating mills. This is a solid rubber plug to displace the wooden plugs commonly used. It is made in all sizes likely to be in demand, and has an internal cone of such form that the opening will not be easily clogged by sticks or refuse.

Jeffrey water elevators are described in special price list No. 62 A, published by the Jeffrey Manufacturing Company, of Columbus, Ohio. These elevators have single or double chain with buckets made of heavy galvanized iron and are intended to lift water from 10 to 30 ft. deep, though they can be used for deeper wells with a heavier chain. A bevel gear jack is used for horse-power, though steam, electric, gas or water power can be used if desired.

The American Blower Company, of Detroit, Mich., issues illustrated catalogue No. 141, a 42-page pamph-

let treating of pressure and volume blowers. The pressure blowers are made almost entirely of steel, the hub and spider being of malleable iron. The blast wheel is strong and easy running, the bearing being self-aligning and self-oiling with large bearing surface. These blowers are designed especially for cupola. The company's volume blowers, while differing in details are except for the casing made of the same material as the pressure blowers, and are designed for blowing furnaces and forges and for supplying draft to steam boilers.

The American Air Compressor Works, of New York city, has issued a small pamphlet, which is printed in Danish by the company's agent, Kay Dyhr, of Copenhagen, Denmark. The pamphlet describes the American air lift pumping system, and a few types of the American air compressors and governors. It also contains cut and descriptive list of the direct acting compressor manufactured by the Union Steam Pump Company. The American Air Compressor Works is exporting goods to Russia, India, Australia, France and Germany, and the prospects for this export trade were never better than at the present time.

The National Electric Improvement Company of New York City, issues a superbly illustrated and finely printed pamphlet of 44 pages, describing the Eblight system of electric lighting for display illumination or for quick and handy installation in mines, mills and factories. This system consists of a combination of flexible cables and of specially prepared surfaces, with Eblight lamps, having sharp pin terminals. The lamps may be stuck in and pressed home at any point on the cables, and yet have firm support and perfect electrical contact. The merits claimed for the system are economy, safety, imperviousness to moisture, fumes and gases, durability, flexibility and adaptability. The material can be used over and over again; only the highest grades of insulation and workmanship are used, and when in use all metal parts are entirely protected from contact with air, moisture or deleterious fumes. Short circuits are impossible. The system thus offers great advantages for use in mines and tunnels, where ordinary electrical material may be easily damaged.

R. D. Wood & Co., of Philadelphia, Pa., issue a finely illustrated pamphlet of 104 pages calling attention to their hydraulic tools and machinery. The company states that its Camden Iron Works is equipped with modern tools of all sizes and its foundries make castings up to 50 tons weight, thus giving unequalled facilities for the production of hydraulic and other machinery of the heaviest class. The company calls particular attention to its hydraulic valves, including the Shem hydraulic operating valve, pulpit valves, quick exhaust valves, etc. The tools, fitted with hydraulic power, shown in the pamphlet, include plate shears, billet and slag shears, including a universal beam shear of the turret type, with triple power intensifier; split and bar shears; punches, including portable punches and those for work of the heaviest class; die, flanging, forging and forming presses; bender's portable riveters and others of the largest size for locomotive and marine work; hydraulic hoists and cranes and triple-expansion pressure pumps. The pamphlet, like others issued by the company, is neatly printed and has a good index.

GENERAL MINING NEWS.

(From Our Special Correspondent.)

Forward Reduction Company.—Dr. Chauncey B. Forward, president of this company, recently filed a petition in bankruptcy in the United States District Court at Cleveland, O. His schedule shows that he owes \$478,587 and has assets worth \$4,225, of which \$910 is exempt. The company was engaged in the refining of oil and similar products in Texas and elsewhere, under a secret process of Dr. Forward's discovery. It has a capital of \$5,000,000, of which \$2,800,000 has been issued, the balance being held in the treasury.

Valley Iron Company.—The stockholders of this company—a new corporation which will develop mineral lands near Sulphur Springs, in Dale County, Ga., and in De Kalb County, Ala., on the Queen & Crescent Railroad line, between Birmingham and Chattanooga, Tenn., and which purposes building 2 furnaces and other works—will meet in Birmingham shortly for formal organization. The company has taken up a charter granted by the Legislature of Alabama in 1902 to the Ensley Pipe and Steel Company, with capital stock \$250,000. This amount has been increased to \$1,000,000, and officers will be elected at the meeting. It is the intention of the company to begin the work of constructing the plants at once, and by January, 1904, the concern should be making iron. The furnaces and other plants will be of the latest pattern. Large tracts of ore and coal lands have been acquired. Former officers of the Tennessee Coal, Iron and Railroad Company will be interested in the new company.

ALASKA.

NOME DISTRICT.

Late advices say that extensive plans are making for work next winter. The Northern Mining and Trading Company has placed an order for 10,000 ft. of T-trails and 300,000 ft. of timber for underground work in Anvil benches. The Pioneer group, consisting of 32 placer claims on the bench of Snake River, opposite the mouth of Gold Bottom, has been sold to the Corson Mining Company by the owners, W. H. Bard, W. H. Tate, and William White. Mr. Bard was instrumental in putting the deal through. The figures and terms were private.

The Nome Exploration Company, of which J. W. Kelly is president and manager, on July 29 bought 9 claims and interests from Jack Cooper and Louis Lane. All the ground lies in the vicinity of Nome, one of the claims being on Newton Gulch. The figure was \$30,000 with a substantial cash payment, and the balance in deferred payments.

Another sale was that of the Sugar claim on the hill between Anvil and Dexter Creeks. This property was located by Swede sailors and opened up by sinking shafts 10 ft. or more to bedrock. A big body of low-grade gravel was found in some places having a depth of 50 ft. The property was worked last winter and the winter before. Several tunnels and cross-cuts were made without finding the limit of the pay. The property has been bought by the Pioneer Mining Company and the Nome Exploration Company, and the price given out by those interested is \$50,000. The new owners have begun work with two drills, sinking to bedrock, and will continue until the extent and value of the gravel deposit is learned.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

North Star & South Keystone.—As soon as matters relating to the title of the North Star are settled, it is expected that work will be resumed on both these mines at Amador City.

Oncida Mining and Milling Company.—In this property, near Jackson, Mr. J. H. Mooser, 320 Sansome street, San Francisco, secretary, the underground prospects are improving. The last clean-up of the 40-stamp mill left a balance of \$8,000, after paying expenses.

Wildman.—In this mine, at Sutter Creek, John Ross, Jr., superintendent, a new level is being opened up at 1,400 ft. Thirty stamps of the mill are kept crushing, and 75 men are employed. It is expected that as soon as developments warrant work will be resumed on the 3-compartment shaft, now down 600 ft., but on which no work has been done for 2 years. The property is now owned by Spokane, Wash., men.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Fort Ritter and Maine.—Work is now being done on these claims, at Eldorado, under supervision of M. Voorhies. An arrastra is being used at present.

Gwin Mine Development Company.—The shaft on this mine, F. F. Thomas superintendent, is down 1,840 ft., and sinking is to be resumed. The 80-stamp mill is running day and night.

Lancell.—In this hydraulic mine, near Mokelumne Hill, P. L. Schuman superintendent, a clean-up after 42 hours' run yielded 107 oz. gold. One nugget weighed 2 oz.

KERN COUNTY.

(From Our Special Correspondent.)

Amalie District.—H. Phillips, in this district, has found a vein of molybdenum which is to be developed. There is considerable activity in the gold mines, but the ore has to be shipped to smelters. There is some talk of H. H. Blood and others putting up a local smelter.

Butte.—The last clean-up of this mine, at Randsburg, netted \$63 per ton.

Contract.—This mine, owned by T. J. Harris and his brother, of Griffin, Ventura County, is near the Kern-Ventura line, and is under bond for 30 days at \$20,000. They are down 180 ft., and at that point ore was mined which yielded \$8,000 at the last clean-up.

Keyes.—This mine, at Isabella, has been closed down by Mr. Thornton and returned to the original owners, the Walker Brothers. The difficulty was cost of fuel to do the pumping.

Lady Belle.—This mine, near Kernville, is putting in steam hoisting and pumping machinery and timbering the shaft.

Stringer.—In the Stringer District, near Randsburg, H. Hough, J. Robb, J. Balschweid and Fritz Utecht have uncovered a 5-in. ledge of \$100 rock in a fraction adjoining the Merced Mine. They are also working the Pearl Wedge claim in the same district.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Merced Commercial and Mining Company.—This

company, at Mount Bullion, owning the mines on the Fremont Grant or Mariposa Estate, C. C. Derby manager, is shipping large quantities of sulphurets to the Selby Lead and Smelting Company at Vallejo Junction.

MERCED COUNTY.

(From Our Special Correspondent.)

Col. J. E. Doolittle, of San Francisco, is about to put a Keystone prospecting drill at work on the Merced River in the vicinity of Snelling and Merced Falls, to test the ground with a view of operating gold dredges if the ground is rich enough to warrant it.

MONO COUNTY.

(From Our Special Correspondent.)

John Clark and Charles Bucknam, of Sonora, report having found fine copper prospects between Bodie and Bridgeport, and Sonora men have raised money for them to work the ground.

Crystal Lake Mining Company.—This property, at Lundy, is owned by a Waterville, Me., Company, with R. T. Pierce as superintendent. It owns the Bryant, Jackson, Lakeview, Lucky Morton and May Lundy mines, and is working about 100 men. Five stamps are to be added to the 15-stamp mill. The lower tunnel is in 1,350 ft.

Goleta Consolidated Mining Company.—At this property, at Jordan, H. W. Nelson superintendent, work has been temporarily suspended, but will be resumed in a few months. A raise is to be made from the 700-ft. tunnel to the 350-ft. level, where there is a large ledge.

NEVADA COUNTY.

(From Our Special Correspondent.)

Conlon Mining Company.—This property, near Grass Valley, belongs to San Francisco and Eastern people with J. A. O'Connor as superintendent. On August 18 a fire destroyed the entire plant consisting of hoisting works, compressor, pumping outfit and new 10-stamp mill. The loss amounts to over \$20,000, with \$5,000 insurance. The mine employed 25 men, and was just beginning to make some money for the stockholders.

Hunken.—J. A. Jeffrey and Mrs. C. W. Porterfield have applied to the California Debris Commission for a license to operate this mine, near Emigrant Gap, by hydraulic process, the tailings to be deposited in Diamond Creek.

Pennsylvania Mining Company.—This company, which won its suit against the Grass Valley Exploration Company, at Grass Valley, has arranged with the North Star Mining Company for a pumping plant, which will keep the mine free from water even when the W. Y. O. D. Mine, adjoining, shuts down. Electric power will be used.

Red Cross.—This mine, near Omega, F. Enzensberger superintendent, has purchased a 20-stamp mill with Frue vanners, hoist, etc., all to be delivered within 90 days.

Union Hill.—On this mine, at Grass Valley, Eugene C. Crellar superintendent, operations will shortly be resumed. Work was suspended at the time of the death of Capt. Thomas Mein, who was the largest stockholder.

PLACER COUNTY.

(From Our Special Correspondent.)

Gold Reef.—At this mine, near Shady Run, T. H. Wilkins superintendent, the pay-streak in the channel has been found. The mine was at one time worked by hydraulic process, but on account of the debris decisions, subsequently became a drifting proposition, but no sufficient pay-streak was found. Lately a Tacoma, Wash., company took hold of the claim, and has succeeded in finding a part of the channel which will pay to drift. A quartz vein has also been found on the property.

PLUMAS COUNTY.

(From Our Special Correspondent.)

Mill Creek.—The quartz and gravel property, 2 miles from Quincy, has been purchased by M. C. Miller, of Minneapolis, who will proceed with development work at once.

RIVERSIDE COUNTY.

(From Our Special Correspondent.)

Arica Group.—These mines are about 60 miles south of Danby, San Bernardino County, and are being actively worked. Mr. C. H. Gray is the superintendent. The shaft at the mine is 120 ft. deep. The old Cooley Mine, owned by J. T. Brown, is in the same region.

SACRAMENTO COUNTY.

(From Our Special Correspondent.)

Nickerson.—On the Little ranch, near Folsom, C. M. Nickerson and P. Dorian are sinking on a quartz vein, and are working the ore in a steam arrastra. Most of the mining in that locality is drift mining from the auriferous gravels which lie about 60 ft. below the surface.

SAN LUIS OBISPO COUNTY.

(From Our Special Correspondent.)

Karl Quicksilver Mine.—This was formerly the old Sunderland Mine, near Adelaide, and it is now employing 80 men, and has a Scott reducing plant in running order. The mine was idle for years, but has lately been brought into the ranks of the quicksilver producers.

Libertad.—This quicksilver mine is 4 miles from Adelaide, and is owned by the Libertad Quicksilver Mining Company, composed of citizens of Paso Robles and Watsonville. Preparations are under way for the erection of furnaces.

Madrone Quicksilver Mine.—This mine, southwest of Paso Robles, has a 10-pipe retort.

Oceanic.—This quicksilver mine, near Cambria, has its 48-ton Litchfield furnace in running order. The mine has been re-opened by Los Angeles capital.

SHASTA COUNTY.

(From Our Special Correspondent.)

Asbestos.—Miller Brothers and Thomas Dobler have found a deposit of asbestos near Sims station. Generally speaking the asbestos found in this State is not of very good quality, though good enough to be ground up for boiler coverings, etc. The only chrome mines being worked in the State are also near Sims station.

Balaktala.—This copper mine, 7 miles from Copley, is reported purchased outright by Peter Kimberley and associates of Pittsburg. They have had the mine under bond and have been prospecting with diamond drills.

Mountain Copper Company, Limited.—This company, of which Lewis T. Wright is the general manager, has its furnace plant at Keswick and the mine is some distance back in the mountains at Fielding, a railroad connecting the two points. At the Iron Mountain Mine owned by the company 350 men are now at work. The force has been much reduced since the introduction of machine drills. Extraction of ore is proceeding on all levels, and the mine is cool. A new level called the Knucky Tunnel, is being driven, which will tap the ore body about midway of the mountain higher up and in a different quarter from the other tunnels. Some ore is being shipped to the smelters at Keswick from the mines of Wardner, Idaho. Heretofore the Wardner ore has been shipped to Omaha. This is doubtless an experimental shipment.

"Pot-Hole" Find.—A river miner on the Sacramento near Keswick station took out \$180 from a pot-hole in the river bed the other day. The low water in the streams at this season gives good opportunity for this kind of work.

SIERRA COUNTY.

(From Our Special Correspondent.)

American Flag.—Work is to resume on this mine, on Wallapai Mountain, this fall. It was a producer of high-grade silver ores. H. H. Watkins and others of Kingman own the mine.

Badger.—This mine, at Chloride, belonging to Thomas Chadwick, is to be worked under lease and bond by a Chicago company. The mine has a 2-ft. body vein of gold and silver ores.

Empire.—This old mine, at Downieville, owned mainly by the McIvor estate of Mission San Jose, is being reopened by Captain Buckley. The 400-ft. main shaft is to be extended to 1,000 ft. The property is supplied with electric power. At first 16 men will be employed. A mill is not projected until more development is done.

SONOMA COUNTY.

(From Our Special Correspondent.)

Uncle Sam Quicksilver Mine.—At this mine, near Cloverdale, the bricklayers have started preparing for a 10-ton furnace. While excavating for a roadway a new cinnabar vein was recently uncovered.

STANISLAUS COUNTY.

(From Our Special Correspondent.)

Prospecting still continues by the company, which intends to dredge the Stanislaus River near Knight's Ferry. A new drilling machine has been received and will be put in operation in the Warner bottom.

TEHAMA COUNTY.

(From Our Special Correspondent.)

Sulphur.—It is reported that the deposit of sulphur lying in the eastern part of the county and known as Supan's Sulphur Mine is shortly to be opened and developed.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Duleek.—On this mine, near Groveland, work has commenced on the new double track tunnel and machinery has been purchased. Dr. Kellar,

of San Jose, Santa Clara County, is largely interested in this property.

Jumper Gold Syndicate of California, Limited.—This company owns one of the largest producers in California at Stent—the Jumper—and also owns other mines in El Dorado County and elsewhere. The New Era is also one of its mines at Stent. Mr. P. Geo. Gow has been general manager for years, but friction has developed between him and the company. The company is a Scotch one, with its principal office in Glasgow. Under a contract made in 1895 Mr. Gow was to receive \$420 a month as manager and 10 per cent. of the profits of the mines. He has brought suit against the company for payment of this percentage, which he alleges he has not received. The company in turn has sued Mr. Gow to refund certain moneys alleged to have been received by him above the purchase price of properties bought by him for the company. The company sues for an accounting and for repayments of amounts alleged to have been obtained by him improperly. The stock in the company has dropped from \$45 to \$7.50 per share, yet the profits of the mine last year were \$196,277. Secretary Geo. Parker and Director Robert Graham of Glasgow have been in California looking after the affairs of the company. Mr. Gow is no longer the manager.

Lost Fox.—A 20-stamp mill is being put up on this mine, near Carters. The shaft has been sunk 250 ft. and 100 ft. drifts run.

Moody.—Capt. W. A. Nevills has foreclosed on the Moody Mine of the Tuolumne Mother Lode Development Company, to satisfy a mortgage.

Nonpareil.—Work is to be begun on this mine, belonging to the Longfellow Gold Syndicate, A. P. Dron, superintendent. The machinery is in running order.

New Albany.—At this mine and the Washington, near Carters, Messrs. W. H. Martin and F. M. Smith, of San Francisco, will install machine drills and prosecute work.

YUBA COUNTY.

(From Our Special Correspondent.)

Victor Gold Mines.—These mines are in Brown's Valley and under management of Lindsay Scrutton. A deed dated December 9, 1901, was filed last week from the Victor Gold Mines and Commonwealth Gold Mines corporations to John Sontag, of San Francisco, for the Dannebroge, Pennsylvania, Hawkeye, North Light, F. W. P., Victor and Blow Snake claims in Brown's Valley, together with buildings, real estate, machinery, etc. The deed is probably with a view to operating the mines if capital can be secured.

COLORADO.

BOULDER COUNTY.

Very dry weather has been the rule for several months, and mine workings are reported to be dryer than ever known. At some camps there is a shortage of water for mining and domestic purposes.

Ben C. Lowell.—This mine continues to be operated by a good force of miners in running drifts, sinking shafts and stoping. This property is equipped with a good plant of machinery, consisting of 6 by 8 engine, 40-h.p. boiler and No. 5 Cameron pump. At present the management is not shipping.

Consolidated Copper Mining, Milling and Smelting Company.—This company, operating the Fourth of July mines, at the base of Arapahoe Peak, is doing extensive work on the property. Owing to the amount of water encountered in the shaft, the managers have begun driving a tunnel 2,000 ft. below the mine, and expect to cut the vein in the property at about 750 ft. depth.

CLEAR CREEK COUNTY.

Terrible.—This group of claims, at Silver Plume, was recently conveyed from C. J. Nicholas and A. L. Collins to B. C. Catron, Jr., of Georgetown, as trustee. Consideration, \$50,000. There are over 40 patented claims in the group, and it has produced in the early history of mining in this county over \$5,000,000.

(From Our Special Correspondent.)

Consolidated Alpine Gold and Silver Mining Company.—This company has just put in a new 50-h.p. boiler and is making preparations to put in an air compressor and drilling machinery. At present it is working at a depth of 300 ft., and will sink to a depth of 600 ft. at once. Judging from the appearance of the lower level, the prospects are reported good. Mr. Thomas B. Crow is in charge.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—H. S. Shaw, et al., to the Fryer Hill Mining Company, the East Jones, ½ of west 1,000 ft. of Jones, easterly 500 ft. of Oranoke lode, Nevada District. J. C. Coltrin to the Helen

Gold Mining and Milling Company, the Snowdrift, Bluebird and Helen group of 20 lodes, Pine District. Fred Neumayer to John Best, Independence lode, Gregory District. George Estabrook to the Cashier Gold Mining and Reduction Company the Mattie lode, Russell District. City of Black Hawk to J. Mortensen, the Black Bear and Prince Henry lodes, Enterprise District. W. Clotworthy, et al., to T. S. Skinner et al., interests in Independence, Victor, T. M., Jr., and Hail Storm lodes, Russell District. H. M. Teller et al., to F. McKibbin et al., the Stewart & Company lode, Russell District. L. G. Dunavan to A. S. Tucker, the Shabona and Wautauga lodes, Lake and Enterprise districts. E. Klote et al. to the Missouri & Colorado Mining and Milling Company, the 12-100 interest in the Windy Point, Old Ann, Red Man, Edna, Rex, Aladdin, Carrie and J. L. McBride lode claims, Hawkeye District. J. Miller to John Benson, ¼ interest J. B. lode, Hawkeye District, County of Gilpin, to W. O. Jenkins et al. ¼ interest in Silver Blende lode Quartz Valley District.

New Incorporations.—Waltham Mining and Milling Company, capital stock \$50,000, incorporators, M. W. Tanner, A. Anderson, G. Carlson and R. H. Hastie. Powers Mining and Milling Company, capital stock, \$500,000; incorporators, C. W. Wilhelm, E. M. Rhea and H. Hicks. Cumberland Consolidated Gold Mines and Milling Company, capital stock, \$1,500,000; incorporators, A. V. Dickson, F. B. Wise, B. B. Wise, A. C. Dickson, F. W. Hofer, and S. T. Hamilton.

Cashier Gold Mining and Reduction Company.—At the stockholders' meeting a resolution was passed to spend the sum of \$20,000 for new equipment to go on the Meeker shaft which is to be made the main working shaft of the Cashier Group in Russell District. B. L. Campbell, Central City, Colo., has been retained as superintendent.

East Boston.—Boston parties are interested and the property, under the management of Stephen Hoskin, of Central City, is doing well. The daily shipments average between 25 and 35 tons, mostly of milling ores, and the grade has improved steadily. A recent shipment going as high as 10 oz. gold per cord, with the tailings running over \$50 per ton. Some fair grade smelting ores are also being taken out.

Electric Spark Gold Mining Company.—Omaha parties are interested in Grace Darling group of claims in the Lake District, and they have purchased a plant of machinery and will install and erect a shaft building at once. The shaft is 115 ft. in depth, but the grade of ores has been so good as to encourage them to sink it at least 100 ft. deeper. John C. Martin, Black Hawk, Colo., is their agent.

Fairfield Mining Company.—Baltimore parties are interested and in sinking the shaft they have passed through about 40 ft. of splendid ore showing yellow copper and iron, assays running as high as 20 oz. gold per ton, the crevice being about 4 ft. wide. Returns from a shipment of 10½ cords brought a clean-up of over 4 oz. gold per cord, with the tailings still to hear from. They have taken out and are shipping a car-load lot to the Denver Smelter, from which extra good returns are expected. Dr. Nickerson, Central City, Colo., is manager.

Frontenac.—The shaft-buildings and plant of machinery at this mine in Russell District were destroyed by fire Friday, August 22, the loss being about \$3,000 with no insurance. Fire started from a candle while a miner was tarring the inside of a tank. The property is owned by Fred Kruse and others, of Central City.

Fryer Hill Gold Mining Company.—This company, represented by Frank Shaw, of Denver, has purchased the Jones and Oranoke claims in Nevada District, the purchase price being reported at \$15,000, and it is presumed that developments will follow.

Gould & Curry.—Denver and local parties are associated in a lease and bond, and after cleaning out the shaft to a depth of 600 ft., they are preparing to install a 50-h.p. plant of machinery as well as to erect a 25 by 50 ft. shaft building. The property has been an excellent shipper, but has been idle for several years. As soon as the bottom is reached the lessees will sink it 300 ft. deeper or to the 1,100 ft. point. H. A. Hicks, Central City, Colo., is agent for the interested parties.

West Flack.—A local pool has taken a lease on this Quartz Hill property and is getting ready to install machinery and fix up the building. The property is credited with a fair production, its depth being over 500 ft. William Eva, Bald Mountain, Colo., will be in charge.

JEFFERSON COUNTY.

Leyden Coal Company.—This company has decided to sink the main shaft on its property, and will commence work as soon as materials can be landed on the spot. The land owned by this company is near the terminus of the Denver & Northwestern Road, west of Arvada. The shaft is to be 70

ft. deep and is to be one of the largest coal shafts in the lignite fields.

LA PLATA COUNTY.

San Juan Gas and Coke Company.—This company is said to be backed by Pittsburg, Boston and New York men. It has been securing coal land, and will supply Durango with gas. W. E. Howell will be manager. The company proposes to have its own brick yard, manufacturing pressed and other brick, and will sell coke to smelters.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Your correspondent is reliably informed that a mammoth deal which will mean the furnishing of electrical power here for the mines and smelters is about closed with New York parties at the head of the new combination, but no positive information will be given out for a few days yet. Such a project will mean much for the district, as with the immense pumping propositions necessary to carry ahead successful mining here the fuel proposition has always cut an important figure. The large ore bodies of the district are yielding a much lower grade, and cutting down of expenses on all sides is necessary in order to conduct successful mining operations.

Bangkok-Cora Belle Mining Company.—The company's property on Fryer Hill has been closed since 1896, but was recently leased to the New Fryer Hill Mines Company. At the annual stockholders meeting just held L. H. Jackson was elected president; Louis Wagner, vice-president; J. H. Crandell, secretary-treasurer. The reports show the company free from debt with a balance in the treasury. The company has already paid \$100,000 in dividends from past operations.

Corona.—The shaft is going to tap the lower ore shoots. The new shaft is down over 300 ft. Some good bunches of sulphides have been met with. They are after the A. Y. & Minnie extension.

Gold Basin Mining Company.—The shaft has been started a further distance of 100 ft. and has already cut a new vein which is rich in gold. Average shipments from the upper workings show over 2 oz. gold and the new vein is still better. This shaft is on the Big Four ground.

Louisville.—The new owners, Reynolds & Hanfifed, have a fine surface plant and are developing the iron ore bodies in different levels.

Matchless.—Your correspondent is privately advised that within a very short time this old time property, which made millions for the late Senator H. A. W. Tabor, will again be actively operated in addition to the small lessee work now going on. Some months ago the property was sold at sheriff's sale to satisfy a judgment of Herman Powell of some \$15,000. Mrs. Tabor, however, is arranging for control, and if she gets it will resume important operations.

Mayflower.—New lessees recently began prospecting at 125 ft., and are following a vein that shows 2 ft. of hard carbonates assaying 185 oz. silver and 40 per cent lead. Arrangements are being made to ship.

Rialto Mining Company.—This important territory controlled by Boston and Denver people and operating through a 1,200-ft. shaft on the Pyrenees has been leased to the Small Hopes Mining Company. Manager Mudd, of the latter company, is preparing to get the water out of the 1,200-ft. drift and search for the extension of the Greenback ore shoot of iron sulphides.

Rubie Leasing Company.—The new owners will shortly start a new drift to connect with the Yak. This will be 1,000 ft. long, but will give an opportunity of satisfactorily handling the low grade ores.

Robinson Smelting Company.—This pyritic plant at Robinson, now closed, is to be enlarged and resume operations. Reports that the recent closing down of the plant was due to a failure of the process are denied. The company has large ore bodies in its own territory of low grade material that can be successfully handled and also has a large territory to draw upon. Several new furnaces will be added. Mr. Frank Bulkley is the general manager.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Mining Transfers.—Miles McCue to J. B. Sinclair, Hidden Treasure lode; Nellie Sulley to George W. Howard, Grand Duke lode; Swan Elias to W. E. Zierden, Swan Elias group; Frank M. Holland to Rea H. Hunt, Lawrence lode; John Curren to James Clynes, Eagle lode; C. E. McConnel to the Frisco Mines Company, Sewell lode; N. R. Bagley and Sidney Van Dusen to the Frisco Mines Company, Malone No. 2 lode; P. B. Beatty to N. R. Bagley, Lillian B. lode; S. C. Usher to Rasmus Hansen, Crown Point et al. lodes; Pittsburg Mining and Milling Company to Isaac Sonnenburg, Colorado et al. lodes; N. R. Bagley to Henry A. Rideout, Yankton lode; M. S. Beach to Joseph Perrier, Sussex lode; County Treasurer to

M. S. Small, tax deed Toronto and Faneta lodes; Joseph L. Hill to N. R. Bagley, Yankton and Mineral Point lodes; Mineral Mountain Company to Joseph L. Hill, Mineral Point and Yankton lodes; County Treasurer to Mattie G. Ritter, tax deed Dee lode; Benjamin Duval to T. J. York, bond and lease Picket lode; J. N. Kloster to Mary Kloster, Bucyrus Girl et al. lodes; Robert L. Hines to James Pilling, Maryland lode; Benjamin Johnson to Augusta Anderson, Emma lode; Michael Curran to John Sweeney, Eagle lode; August Fast to Boston & Silverton Mining Company, Wanda lode.

PARK COUNTY.

Kentucky Belle.—This mine, in Buckskin Gulch, is operating the Sherman stamp mill, producing a carload of concentrates per week.

London.—This mine, probably the best producing mine at Alma, has started a new tunnel of 800 ft. that is being driven with power drills.

Snow Storm Hydraulic Company.—This company, at Alma, has made many improvements, having an excellent plant, with electric lights.

SUMMIT COUNTY.

Glen-Mohawk Mining Company.—J. A. Bush, of Salt Lake, Utah, has charge of this company's property, near Breckenridge. He is running a tunnel and doing considerable development work in the mine. The tunnel is in 710 ft.

Gold Pan Mining Company.—This company, of which George H. Evans is general manager, has its tailings dump, near Breckenridge, completed. The elevator sluice boxes are dumped on to a belt conveyor, carried 110 ft, and dumped to another conveyor, which runs 300 ft. The total radius of the conveyor is 410 ft. and tailings are stacked to a height of 72 ft. automatically by a tripper.

North American Gold Dredging Company.—This company, at Breckenridge, has a Bucyrus dredger handling 2,000 tons of gravel daily.

GEORGIA.

BARTOW COUNTY.

(From Our Special Correspondent.)

Cartersville.—A new ocher mill is under construction near this city by a company organized by J. H. Mattun, J. Diller Bude, M. L. Beck and L. S. Goodman, all of Huntingdon County, Pa. The property has been well chosen. It consists of 100 acres fronting on the Etowah River, and contains one of the best yellow ocher mines in this district.

LUMPKIN COUNTY.

Pratt Pyrites Mine.—Col. Pratt, owner of this property, is now doing considerable development work and arranging for the opening of the property on a considerable scale. Work has also been begun on a dam across the Chestatee River, to furnish power. The mine is 6 miles east of Dahlonega. Surveys are being made for a branch of the new Gainesville & Dahlonega Railroad. This branch will be 6 miles long, running from Loudon's Crossing up Long Branch to the mine. It will have a down grade for the loaded cars all the way from the mine to the junction with the main line.

IDAHO.

BLAINE COUNTY.

Camas No. 2.—The business and assay offices, warehouses and other buildings of the Camas No. 2 have been moved from Doniphan to the mine, and the pump, etc., have been removed from the Black Cinder to the Camas No. 2. The mines are to be worked through a new 3-compartment shaft just begun. C. D. McLure owns one mine and intends to buy the other.

LEMHI COUNTY.

(From Our Special Correspondent.)

Tri-Metallic Mining Company.—A new contract for an additional 100 ft. on the cross-cut tunnel has been let by the manager of this property. It is presumed that this work will more than reach the lead, with a drifting margin of 30 ft. or better.

SHOSHONE COUNTY.

Bunker Hill & Sullivan.—Dispatches from Wardner say that it is definitely announced that within two months the ore of this company's mine will be taken through the long tunnel to the mill, instead of taking it up over the hill by the aerial tramway. Working facilities will be increased accordingly. The new tunnel, which runs from the mill, located west of Kellogg, to the mine at Wardner, is in 12,000 ft. The work on the tunnel started just 5 years ago. The development being done on the property is centered on two upraises, to make an opening to the workings above. One raise is up over 900 ft., while the other has been run nearly the same distance. Another 100 ft. is required. Seventy men are at work in the tunnel. Electric cars have been installed, and as fast as the ore and rock are taken out they are taken to the mouth of the tunnel by motor power. The tramway method of conveying the ore to the mills will be con-

tinued until the upper workings are reached by the raise. Then the tramway will probably be torn down. It was put up 11 years ago.

Hercules.—This mine, about 1 mile from Burke, is to install a saw-mill and a 6-drill compressor. The latter will be used for the drills to drive a long tunnel through the hill. About 30 men are employed.

ILLINOIS.

(From Our Special Correspondent.)

Illinois Coal and Coke Company.—Progress is being made in the organization of this company, under charge of Newton Jackson, of Philadelphia, who is promoting the consolidation. Arrangements have been made for the purchase of 23 mines in the district. The expert auditors and mining engineers are now in the field examining the books, titles and accounts of the companies interested, and the consolidation now looks as if it would come about in a very short time. All the coal companies in the Springfield District are included except the Jones & Adams Company and the Clear Lake Co-operative Coal Company, which refused to go in, and the Republic Iron and Steel Company's mine, which was not wanted by the combine on account of its condition and limited territory. It is said to be quite likely that Mr. J. A. Agee, general manager of the Riverton Coal Company, one of the companies in the combine, will be general manager of the consolidation.

INDIANA.

HAMILTON COUNTY.

(From Our Special Correspondent.)

Crescent Coal Company.—This company is sinking a shaft for a new coal mine near Sullivan, on the line of the new Indiana Southern Railroad, now under construction. The company's headquarters are in Chicago, and W. S. Bogle is president.

MICHIGAN.

IRON—DICKINSON COUNTY.

Oliver Iron Mining Company.—This company has secured control of the old Hancock property on the Felch Mountain Range, about 4 miles from the village of Metropolitan, and has an exploring party at work. An old pit has been cleared out and an exploratory shaft is being sunk. This shaft has now reached a depth of 45 ft. Some work for diamond drill operations is also in hand. The Hancock never was a shipper, and exploratory work done in 1876 was confined to testing and sinking. Some good ore was found, averaging about 55 per cent iron and 0.013 phosphorus, but the percentage of silica was so large as to render it unmarketable at that period. There is a good demand for ore of this class at present.

COPPER.

Arcadian.—The Douglass shaft at this mine has reached the 9th level. Exploration is now going on in the 8th level, south from the shaft.

Baltic.—At this company's mill one stamp is now running on rock from the Champion.

Champion.—This company is now supplying rock to one stamp at the Baltic, as well as to one at the Atlantic Mill.

Franklin.—This company has bought a shaft-house from the Arcadian, to replace the house at its No. 5 shaft, which was recently destroyed by fire.

Tamarack.—This company's mill is reported to be stamping about 2,100 tons of rock daily. Of this about 500 tons come from No. 5 shaft.

Trimountain.—The Houghton Gazette reports that this company has encountered the lode with the diamond drill at No. 4 shaft. This opening, which is planned to follow the development of No. 4, will be known as No. 5. The diamond drill, which was put down at No. 4 at approximately right angles with the dip of the rock, passed through 106 ft. of overburden before encountering the ledge. It then bored through the rock for a distance of 21 ft., when the lode was encountered. The cores for the entire depth after the copper bearing rock was struck have shown excellent results. Simultaneously with the diamond drill work in the vicinity of No. 4 a perpendicular exploratory shaft has been sunk. This has now attained a depth of 94 ft. and it is probably within a short distance of the ledge. The diamond drill in its successful quest for the lode was put down at a spot 200 ft. from the shaft. It is impossible, on account of the rolling nature of the land, to approximate the depth of the overburden at the shaft by the results shown in the diamond drill work, but it is thought the shaft will not continue much longer in sand. In the early work in the exploratory shaft much difficulty was encountered on account of the quicksand. This trouble continued for a depth of 60 ft. when more stable earth was struck. The diamond drill has now located the exact position of the lode, and it is the purpose to continue the exploratory shaft to a

depth from which a cross-cut will encounter the lode, as thus indicated by the diamond drill. The lode encountered is the same one that is opened in the three other shafts of the Trimountain, as well as on the Baltic to the north and the Champion to the south. It is variously called the Baltic, Trimountain or Champion lode, but is more generally spoken of as the Baltic, since it was in this mine that was first developed.

Wolverine.—This company started up the second stamp in its mill August 25.

MINNESOTA.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Deering Harvester Company.—The Hawkins and Agnew mines are under the management of Jos. Sellwood. The Agnew is already shipping, though the first work done was in May, and will produce this season about 50,000 tons. A shaft has been sunk and the N. E. ¼ of the N. W. ¼ of section 11, T. 57, R. 21, and is owned in fee by Alworth, Hull & Boeing, lumbermen. The Hawkins Mine is not yet connected by rail with docks, and therefore will be unable to ship for some time. A shaft has been sunk and some ore is on stockpile. The mine will be stripped for milling when a steam shovel can be taken in. It has been opened with the greatest trouble, as the roads leading to it have been practically impassable for a year.

Latonia.—This mine, a Sellwood property, is in Section 10, T. 57, R. 21, and is a large property belonging in fee to Hill & Warren, of Minneapolis. It was explored last year by E. J. Longyear, who found a large amount of ore under a light surface. Mr. Sellwood has let to Butler Brothers a contract to strip 1,000,000 yds. of overburden and to mine 3,000,000 tons, with a minimum to them of 200,000 tons a year. The feeholders' minimum is 100,000 tons and the royalty 25c. Stripping is under way, and the mine will possibly produce this year 75,000 tons.

Longyear.—At this mine, opened this year by Joseph Sellwood, of Duluth, work started last April. The mine is very wet, and 4 pumps are in use. A shaft has been sunk 160 ft. and so much underground development done that the mine will this year produce about 55,000 tons. The ore is low-grade but of considerable extent. It belongs in fee to J. J. Hill and Bennett & Longyear, and ships over the Eastern Minnesota.

Morrow.—This mine, also a Sellwood property, was opened since May. It is a stripping proposition, and a considerable amount of surface has been taken off. It is close to the Pillsbury, and belongs to the estate of J. S. Pillsbury et al. The royalty is 25c. a ton.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Dr. E. A. Junkin, of Carthage, has sold to Henry Ralston, of Chicago, Ill., a half interest in 28 acres of unprospected land between Webb City and Joplin for \$10,000.

New Mining Developments.—Prospecting is now most active in the eastern part of Jasper County, where is the finest agricultural land in Missouri. Two miles south of Reeds the McGowan Mining Company are working from a shaft 200 ft. deep. A drift at the 190-ft. level is being run into a 35-ft. face of ore. The mine is equipped with a 100-ton concentrating mill, and makes about 40 tons of high-class concentrates a week. Two cars were loaded the past week. The Plymouth Rock Mining Company has 5 lots on the same tract and has completed a 100-ton mill. The main shaft is 225 ft. deep, and the ore is being taken from a 30-ft. vein on the 210-ft. level. This mill has the second largest air compressor in the district. The Peoria Mining Company, a mile north of Reeds, has put up a 75-ton mill, and is working from 2 shafts at a depth of 138 ft. West of these mines, at Sarcocixie, the Sangamo Mining Company has a shaft down 169 ft., is in ore 60 ft. thick, and is preparing to drift. On the Carnahan lease, adjoining the same, 60 ft. face has been found. The main shaft is 210 ft. deep, and a 30-ft. drift is being driven at the 200-ft. level. A 100-ton mill has been erected and about 30 tons of concentrates are made every week.

Notwithstanding the fact that there is a growing reserve stock of ore in the district there was no tendency to beat down prices manifested last week. In fact, the trend was the other way, for there was one lot of ore which sold for \$39.50 per ton, which is 50c. more than was paid the preceding week. The reserve amounts to about 5,000 tons, which is larger than it has been for several months. This stock is not disquieting the producers, who claim that the smelters need every pound of ore that is produced in the district. They think that the assay price of ore will range about \$35 for 60 per cent. ore for the balance of the season. In fact, the large stock is occasioned by the fact that several lots of high grade ore are

being held and will not be sold by the producers for less than \$40 per ton.

There was no change in the price of the general run of ore. There was decided activity among the buyers and at no time was there any talk of a reduction. The assay prices are ranging widely again. Ore that assays above 60 per cent. sold for \$35 and \$36 a ton on a 60 per cent. basis, while ore assaying under that figure sold for only what would be \$33 and \$34 a ton on a 60 per cent. basis. Lead holds firm and unchanged at \$49 per ton, delivered. For the same week last year the zinc shipment was less by 940,340 lbs., and the lead shipment was greater by 126,300 lbs. and the total value was less by \$60,997. For the corresponding 34 weeks of last year the shipment of lead was greater by 2,806,340 lbs., but the shipment of zinc was less by 14,384,050 lbs. and the total value was less by \$1,025,618. Following are the sales in lbs. reported from the camps of the Joplin mining district for the week ending August 23, 1902:

	Zinc-Ore.	Lead-Ore.	Value.
Joplin	2,900,650	445,620	\$61,679
Galena-Empire	1,331,320	210,960	25,139
Cartersville	1,826,810	321,960	38,050
Aurora	765,190	5,230	11,088
Oronogo	403,240	26,340	7,924
Duenweg	1,207,230	52,760	23,470
Prosperity	429,950	42,370	8,777
Zincite	81,640	.....	1,562
Cartage	150,540	.....	2,710
Central City	138,360	2,900	1,848
Cave Springs	86,300	8,200	1,496
Carl Junction	269,900	.....	4,994
Neck-Alba	109,200	11,300	2,243
Grady	410,000	46,000	5,775
Rebs	11,670	.....	2,010
Total	10,282,000	1,177,490	\$198,745

Zinc value, week, \$169,874; lead, \$28,871; zinc value, 34 weeks, \$5,243,649; lead, \$928,631.

C. V. Petrus Smelting and Manufacturing Company.—This company, of Joplin, has \$50,000 capital, the stock being held by Joplin and Iola parties. The company recently completed a new lead smelter at Galena, Kan., and proposes to erect a plant in Joplin to make various commercial articles from the pig lead manufactured at its Kansas plant.

SULLIVAN COUNTY.

Old Jim.—This mine, near Marion, is shipping zinc concentrates to the Lanyon Smelter, at Iola, Kan. Heretofore the mine has shipped to Mineral Point, Wis.

Roscherry Zinc Company.—The company's concentrator is about to start.

MONTANA.

BEAVERHEAD COUNTY.

Bonanza.—This is the name of a new mining camp, located about 10 miles from Wisdom, near the Big Hole River. A group of claims there has been bonded to W. E. Sanders, of Helena, for \$60,000. There are six claims in the group. Several Butte men are figuring on getting hold of a group there known as the Franklin Stant property. Stant owns the ground and is crushing some of the ore in an arrastra.

Montana Copper and Gold Mining Company.—This Chicago, Ill., company has suspended work at its claims on Stone Creek. A shaft has been sunk 300 ft.

CASCADE COUNTY.

The option held by A. O. Nelson and others of Stillwater, Minn., for the purchase of the Sam Dean and other Sand Coulee coal mines will probably be taken up. Mr. Nelson is now making a final inspection of the properties before paying over the \$50,000 involved in the deal. It is the purpose of Mr. Nelson and associates to open up the properties extensively, giving employment to several hundred miners. A washing plant is to be established. Mr. S. M. Moore, of Great Falls, will probably have charge of the work.

FERGUS COUNTY.

Northern Mining and Development Company.—A syndicate, headed by John A. Drake, of Chicago, has completed a deal for the purchase of the property of this company. The properties have been operated successfully for several years. They are at Giltedge, and comprise between 40 and 50 claims.

North Moccasin Gold Mining Company.—J. D. Waite and Mattie S. Waite have disposed of their interests in North Moccasin mining property to the North Moccasin Gold Mining Company. The property consists of the Santiago, Santiago Fraction, Agnes, Scepter, Possible and Triangle claims.

GALLATIN COUNTY.

Montana Corundum Company.—The new mill is practically finished. Two gasoline engines will run the mill. The company has 22 men employed, some of whom are building a dam at the head of Elk Creek to supply water from a flume which connects with the mill. The mill will have a capacity of 15 tons of ore

per day. Crushers are to be used in reducing the corundum to small crystals or powder fine enough to pass through screens from 45 to 200 mesh.

(From Our Special Correspondent.)

Ada.—Five miners are employed, 2 on ore and 3 on development work. One car of ore is shipped a week. Tim. Downey, one of the owners, is managing the property. The ore carries about 4 per cent copper and a fair assay value in silver. The silver occurs in small veinlets of bismuth, which permeate the sulphide ore.

Buckeye.—This property, at the head of Basin Creek, 12 miles above the town of Basin, under the management of C. J. Davis, is shipping concentrates to Butte. The mill has been thoroughly overhauled, and a new road which shortens the distance to the railroad is completed. The company is now in shape to ship 2 cars of concentrates per week. Capt. Wm. Thompson is superintendent.

Bullion.—The Cataract Copper Mining Company, which holds a bond on this Jack Creek property, is employing 5 men on a contract to drive the lower tunnel under the ore shoot. The lower tunnel is in about 1,400 ft. The upper tunnel is in 1,200 ft.

Deer Lodge.—This property, situated near Basin, is to be operated by an Eastern company, which has purchased outright the Gaffney interest and bonded the interest in the property of Thomas Kane. The machinery formerly used on the Boston, an adjoining property, has been purchased and moved over to the Deer Lodge. It is the intention to sink the main shaft to the 500-ft. level.

Eva May.—T. W. Curtis, of Los Angeles, Cal., has expeted this property with a view of advising the management as to the future development. The shaft is now 600 ft. deep and is equipped with a new Hendrie & Bolthoff hoisting engine, 14 by 18-in. cylinders, good for 1,200 ft. The property is 7 miles from Basin. George C. Drogenfeld is in charge.

Minah.—J. O. Brisco is working ten miners in tunnel No. 4 of this property, near Wickes.

MADISON COUNTY.

(From Our Special Correspondent.)

Beisinger & Beck Mining Company.—The property of this company has been leased for 12 months to T. K. Beisinger & Brothers on a royalty of 15 per cent. It is situated on Barton Gulch, 4 miles from Puller Spring. The ore is silver in the form of glance and staphanite. Some very high grade streaks have been found.

MEAGHER COUNTY.

(From Our Special Correspondent.)

Copper Duke.—The drift on the 65-ft. level of this property, at Copper, has a face of copper ore 5 ft. wide which will average 16 per cent copper. David Folsom, of White Sulphur Springs, is the principal owner.

North Pacific.—Sinking is in progress on the shaft, which has now reached a depth of 565 ft. At a depth of 540 ft. the shaft passed through the slate, and is now in diorite. The property is being operated by the Copperopolis Mining Company, and is situated at Copper P. O. W. W. McDowell is the president and general manager, with headquarters at White Sulphur Springs.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

Colusa Parrot Mining and Smelting Company.—The two new first-motion hoisting engines, one for the Original and the other for the West Stewart properties of this company, are completed and have been shipped from the Nordberg Manufacturing Company, of Milwaukee, Wis. These engines are duplicates and are each 32 by 72 in. in size. They are drum hoists, using 1½ in. round rope, and are adjusted for a 3,000-ft. lift.

Never Sweat.—A reduction in the working force at this property has recently taken place.

Parrot.—The work of repairing the main shaft is receiving the finishing touches. It is intended to have the property again in operation by September.

NEVADA.

CHURCHILL COUNTY.

Keora Mining Company.—This company recently acquired a group of claims and has commenced operations near the old mining camp of Bernice, in the eastern part of the county.

NYE COUNTY.

Montana-Tonopah Mining Company.—This company has been organized by Montana and Utah mining men to operate in the Tonopah District. The company is capitalized at \$1,000,000, the shares having a par value of \$1 each. In the organization, Charles E. Knox is president; A. C. Ellis, Jr., vice-president, and A. G. Cushman, secretary and treasury. These officers, with Charles E. Morris, T. J. Lynch, S. D. Forman, J. B. Thompson, C. W. Whitley and W. P. O'Meara constitute the directorate. Of the total number of shares, 300,000 are set aside to

provide a working capital. The main offices of the company are to be located in Salt Lake. The company's mines consist of 12 claims in Tonopah, as follows: Lucky Jim, Little Tonopah, Little Tonopah No. 1, Jack Rabbit, Sampson, Rose, Mining Chance, Idahoan, Nevada Boy, Cronje, Tonopah Belle and White Elephant. It is stated that 100,000 shares of the treasury stock have been sold, and that the company has purchased the hoisting plant that served the O'Meara-Lynch syndicate in hoisting from the ground which it held under lease from the Tonopah Company. The sum of \$50,000 is in the treasury, and work is to be pushed.

WHITE PINE COUNTY.

Belle Mare Mining and Smelting Company.—This company and the Nevada Copper Company recently consolidated as the Nevada Belle Copper Mining and Smelting Company. The new company owns 500 acres, and has machinery, surface improvements and a 50-ton copper matte smelter on the property of the Nevada Copper Company. A 1,000-ft. tunnel to the Copper King ledge, the principal copper deposit on the Belle Mare, is contemplated. C. W. Sweitzer, of Reno, is president.

Lucky Girl.—The Montana Mining Company has its cyanide plant at this mine in regular operation.

NEW MEXICO.

Abbey Mining Company.—This company is reported operating at Abbey and Water Canon, Socorro County; at Upham, Sierra County, and Rincon, Dona Ana County. The Abbey group is 25 miles north of Magdalena and consists of 12 claims, one of which, the Regent, has a shaft 100 ft. deep, with a 25-ft. cross-cut. On the same vein, further north, is the Regal claim, on which the shaft is down 100 ft., with a 100-ft. cross-cut and a 50-ft. drift. The ore carries copper and silver. In connection with the Abbey group, the company controls 160 acres of coal lands within two miles of the mines. The Little Baldy group of six claims is 5 miles south of Water Canon. The ore carries silver, copper and lead.

The Washington group of four claims is in Sierra County, 10 miles from Upham. The ore carries copper. The Manganese group of 20 claims is in Dona Ana County, about one mile from Rincon. The Abbey Company has at present over 60 men at work at its various groups, under the management of Nathan Hall. The New Mexico office is at Socorro.

GRANT COUNTY.

Golden Giant Company.—This New York company recently filed suit in the district court of this county against Sheriff A. S. Goodell and his sureties on his official bond. The suit grew out of an attachment made by the above sheriff on machinery, etc., and sold at auction to satisfy judgments secured by several parties against Lawrence Waterbury, who a short time ago is said to have purchased the property, and was at that time working the mine. The property is at Pinos Altos.

LINCOLN COUNTY.

Old Hickory Mining Company.—This company, capitalized at \$1,000,000, has been organized to operate the Hoosier group. The company proposes to do a considerable amount of development. A good body of ore is reported opened, running from \$8 to \$12 per ton. The railroad runs within a short distance of the property. Jones Taliaferro, of White Oaks, is president.

SANTA FE COUNTY.

Consolidated Mining and Smelting Company of Cerrillos.—R. B. Thomas is manager of the plant at Cerrillos. The company has spent \$125,000 in making improvements and building additions. It is now equipped with the machinery necessary to reduce ores found in New Mexico and Arizona. George P. Hyde, for many years assistant superintendent of the El Paso smelter, has been appointed superintendent of the Cerrillos plant.

PENNSYLVANIA.

ANTHRACITE COAL.

No special change in the conditions of the strike are to be reported, and there has been no marked incident in its progress. Both miners and operators have confined themselves chiefly to talk and no new action has been taken on either side. There have been, of course, reports that the operating companies were preparing to start up some collieries, but nothing has been done.

BITUMINOUS COAL.

William G. Antrim, of Washington, recently bought in Greene County a tract of about 2,000 acres of coal land in Aleppo Township and a 500-acre tract in Springhill Township. The purchase price of both fields was nearly \$45,000.

Local papers report some discoveries of coal along the Youghiogheny River, near West Newton. The Greensboro Natural Gas Company, which has been

drilling on the Guffey farm near West Newton, discovered three veins which lie below the Pittsburg Coal Company's vein. The first vein is 4 ft. thick, the second 14 ft. and the third, 12 ft. Samples taken out are good coking coal.

Berwind-White Coal Mining Company.—This company is at work laying out ground for a new mine in Cambria County, on the land known as the Cyrus Horner tract. It is about three miles from Windber and two miles from the company's No. 36 mine, which is the nearest. The new mine will be known as No. 40.

Clearfield Bituminous Coal Company.—This company has secured some 23,000 acres of coal land in 4 Indiana County townships for \$900,000. This land was practically the last in the hands of the original owners, and is about 2 miles wide by 6 in length. It is one of the largest purchases ever made in the western part of the State.

Grand Lake Coal Company.—This company, with a capital of \$1,500,000, and composed of members of the United States Steel Corporation, is about to open a new coal field on 25,000 acres in Butler and Armstrong counties. It will build 15 miles of railroad along Muddy Creek, having made a traffic arrangement with the Bessemer & Lake Erie Railway.

Hedstrom Coal Company.—This company, at Dutch Hill, successor to the Brinker Coal and Iron Company, has about 150 men employed and is mining about 350 tons of coal daily. The company has also purchased 260 acres of new coal land, making nearly 700 acres now owned by the company. Ten new Sullivan machines and a new Sullivan air compressor have been added to the equipment.

Oliver & Snyder Steel Company.—This company is preparing to increase its coking facilities by one-third by building a modern plant to be known as No. 3, near Vance's Mills, on the Redstone branch of the Pittsburg, Virginia & Charleston Railway. The investment in the new plant will be about \$300,000. The company owns several thousand acres of the 9-ft. Connelville vein in that section and has already 2 large coking plants, comprising over 700 ovens, in operation. The new plant will start with 300 additional ovens, bringing the total close upon 1,100 ovens, with a daily capacity of some 2,400 tons of coke. To provide coal for the new plant another mine will be opened. It will have two shafts, sunk to a depth of 400 feet, the main shaft being 12 by 26 ft. and the air shaft 12 by 18 ft. Contracts have been let to Joseph Pew, of Nanticoke, Pa., for sinking the shafts. The Vulcan Iron Works, of Wilkes-Barre, will install the hoisting engine and the steel front headings and tipples will be built by the Penn Bridge Company, of Beaver Falls. Bids are now being taken for the erection of the 300 ovens and 50 double houses for the miners.

Pittsburg Coal Company.—S. C. Richardson has sold to the Pittsburg Coal Company 361 acres of coal land in West Pike Run township, Washington County, for \$105,500. Three hundred acres of this tract included but the coal under it, the consideration being \$250 an acre. Sixty-one acres were sold outright, surface and all, and brought \$500 an acre. The tract is situated about four miles from Coal Center, back from the Monongahela River, and adjoins other property of the Pittsburg Coal Company.

Providence Coal and Coke Company.—This company, composed of Pittsburg, Erie and New York City men, recently purchased the farms of J. J. Quigley, for \$18,700, and of the Kelly heirs for \$3,200, as well as taken options on 3,000 acres of other coal land in the vicinity of Kelley station, on the Allegheny Valley Railroad, 28 miles from Pittsburg. It is said those interested are connected with the Beech Creek Railroad, and that this road will build a branch down Taylor's Run and across the river at Kelley.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Black Hills Mining Men.—The August meeting of the association was held in Custer, and an excursion was run to Sylvan Lake. The principal speakers at the meeting were Congressman E. W. Martin, James Baldwin, just returned from West Africa, and H. N. Ross, who panned the first gold in the Black Hills while with Gen. George B. Custer in 1874.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Columbus Consolidated Mining Company.—The old Columbus shaft is being enlarged from 2 to 3 compartments, each compartment to be 4 ft. 9 in. by 5 ft. It will be continued to the 500-ft. level. A new air compressor and sinking pump are being installed and a new hoist has been ordered. The company has purchased the property of the Baltimore & Deadwood Mining Company, at Gayville, which takes in the 20-stamp cyanide mill that is under lease to the Portland Mining Company. The Portland lease expires September 15. The Columbus has purchased

all the ground lying between Deadwood and Black-tail gulches, embracing 645 acres, and is working in ore at 5 different places on the ground.

Hidden Fortune Mining Company.—The foundation walls for the new cyanide plant are complete, and the superstructure is being raised. The steel cyanide tanks are being put together, and machinery is arriving for the crushing and elevating departments.

Horseshoe Mining Company.—G. W. Murphy, of Milwaukee, Wis., and W. B. Frisbie, of Chicago, secretary and general manager, respectively, assert that the deal for the purchase of the National Smelting Company's plant at Rapid City is practically closed, and that the Horseshoe Company will take possession in September. The smelter is to be paid for in stock in the Horseshoe Company at par. The new 1,000-ton cyanide plant of the Horseshoe will be erected at the Mogul Mine, in Ruby Basin, instead of at Pluma Station, as originally planned, and the site has been surveyed. The contract has been let to the Allis-Chalmers Company. A preliminary survey has been made for a cable tram system, by which it is proposed to convey the ore from the various mines of the company to the plant. The present cyanide plant at Pluma is to be enlarged from 100 to 300 tons daily capacity. With its three plants the company will be enabled to treat 1,600 tons of ore daily.

Penobscot Mining Company.—The frame work for the mill building at the Realization Mine of the company is going up, the foundation walls being finished.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Shipments.—Shipments from Salt Lake City for the week as reported by the banks were: Gold, silver, copper and lead ores, \$170,700; base bullion, \$116,900; gold bars, \$43,300; auro-cyanides, \$2,500; total value, \$333,400.

BEAVER COUNTY.

(From Our Special Correspondent.)

Frisco Shipment.—The Horn Silver sends in 7 cars of high-grade ore for the week ending August 23.

Majestic.—The secretaryship of this company has passed into the hands of Joe Henshaw. His regime will begin September 1, with general offices in the Dooly Building, Salt Lake. Superintendent S. Osborn has been in Salt Lake purchasing tools and equipment for use at the Old Hickory and Vicksburg mines of this company.

JUAB COUNTY.

Billings Iron Mine.—This mine, in the Tintic District, has been leased by Eliza Shafer, of Salt Lake City, to A. A. Noon, of Provo. The lessee is to pay 20c. per ton royalty on all iron ore shipped and one-half of the net proceeds of all other minerals that may be found in the mine.

(From Our Special Correspondent.)

Tintic Shipments.—Ore shipments from Tintic for the week ending August 23 are as follows: Dragon Iron, 11 cars; Gemini, 11 cars; Mammoth, 12 cars; Martha Washington, 1 car; Yankee Consolidated, 6 cars; Bullion-Beck, 10 cars; Eagle & Bluebell, 1 car; Grand Central, 10 cars; May Day, 3 cars ore and 3 cars concentrates; Uncle Sam, 2 cars ore; Carisa, 9 cars; Lower Mammoth, 3 cars; Southern Faulkner, 8 cars; Victor, 2 cars; Ajax, 2 cars.

Centennial Eureka.—Work has again begun with the addition of 45 men to clean out the mine and prepare for heavy extraction of ore. It is expected 300 men will be employed during active operations. The contract system will be installed wherever conditions permit.

MILLARD COUNTY.

Taylor-Maycock Mining Company.—This company, which will have its principal office in Fillmore City, and will conduct the development of a number of claims in the new mining district on Antelope Island, has been incorporated. The company is capitalized at \$400,000, divided into shares of the par value of 50c. each. John A. Taylor is temporary president, Edward Maycock vice president and treasurer and Thomas Taylor secretary. The officers, including Heber J. Mitchell and William Collins, form the directorate.

SUMMIT COUNTY.

J. I. C.—The developments in this mine, near Park City, are reported to be so encouraging that an order has been given for a 50-h.p. hoist and other machinery.

Wabash.—At the property of this company, at Park City, the recently installed electric lighting and ventilating plants are reported by Assistant Manager Matt A. Dougherty to be working perfectly. The equipment includes a 15-h.p. upright engine that operates a Sturtevant 1,700-revolution blower, which frees the mine workings of impure air, smoke and gases generated from the firing blasts. The electric light plant is run by a dynamo of several hun-

dred light capacity, and the hoisting works, boarding house, bunk house and the mine itself are now all being illuminated by incandescent lamps.

SALT LAKE COUNTY.

Kennebec Mining Company.—This company, capitalized at \$400,000, in \$1 shares, is to work the old Reed & Benson and Eclipse mines, lying between the Big and Little Cottonwood, and consisting of over 300 acres of patented ground. The company will organize with C. W. Bennett, president; John W. Donnellan, treasurer, and A. W. Casey, secretary; the remaining directors being George H. Robinson, Willard F. Snyder, W. J. Craig and Sam M. Levy. W. J. Craig is to be manager. The old Reed & Benson and Eclipse mines were well known in Alta in the early days, and together they produced ore that netted, after standing transportation charges to Swansea, Wales, more than \$1,000,000. The Reed & Benson was operated through tunnel workings and the Eclipse through a shaft that was sunk 800 ft., and old Telegraph workings. The new company proposes to drive another tunnel and sink the old Eureka shaft.

Steamboat Mining Company.—This company, which is engaged in prospecting its territory at the head of Snake Creek Canyon, across the divide east from the head of Big Cottonwood, has just installed a new compressor plant, and has resumed operations in its long tunnel. The power to operate the compressor, which is a 14¼ by 18 in. Ingersoll, is derived from a Pelton wheel located about half a mile down the canyon from the mouth of the tunnel, from which point the water is piped. The fall in that distance is about 200 ft.

(From Our Special Correspondent.)

Bingham Shipments.—During week ending August 23 the following consignments reached the samplers in the Salt Lake Valley: Ben Butler, 7 cars; Neptune, 6 cars; Bingham Copper and Gold, 5 cars; United Bingham, 1 car; Columbia, 1 car. From Alta, the Grizzly, 1 car; American Fork, the Live Yankee, 1 car.

United Bingham.—Manager H. Joseph reports disclosure of 12 inches of galena running better than 50 per cent. lead and 5 per cent. copper and some gold and silver made in Bully Boy ground.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—During the week ending August 23 the mines of the camp have put out the following tonnage: Daly West, 4,019,970 lbs.; Anchor, 251,110 lbs.; Ontario, 422,070 lbs.; Silver King, 1,855,470 lbs.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—For the week ending August 23 the Ophir Hill has sent in 19 cars of concentrates and the Hidden Treasure 3 cars. From Fish Springs the Utah sends in to the samplers 2 cars of ore.

WASHINGTON.

FERRY COUNTY.

(From Our Special Correspondent.)

California.—Twenty tons of high grade ore is sent daily to the Granby Smelter, at Grand Forks, B. C. The second class ore is retained at the mine to await lower rates of freight and treatment, which are promised shortly. The smelter returns from the last car-load shipped showed that the gross value of 37 tons was \$2,803 and the lot netted \$2,404. The freight was \$156 and the treatment charged was \$243. The mine now employs 55 men. A contract will be let soon to sink the shaft 100 ft. deeper.

Gold Ledge.—The tunnel is in 1,185 ft. Water is coming in freely, and there are other indications of being in the vein, although no quartz has yet been encountered.

Pasco & C. E. Nye.—The east vein has been encountered under the surface debris on the south end of the C. E. Nye, just over the north end line of the Pasco claim.

Princess Maud.—A raise is being put up on ore from the 400 to the 300-ft. level, preparatory to stoping.

LEWIS COUNTY.

Mineral Creek Mining and Reduction Company.—The saw-mill is busy getting out lumber. The company hopes to complete the plant and make arsenic during this fall. The mines are situated 50 miles south of Tacoma, and can be reached in one day by carriage. A railroad is one-half way out and is being extended toward the camp. Some time next year it will reach Elbe, which will leave only a 9-mile haul from mine to railroad. The company has made 5 miles of good wagon road. Harold Howes is superintendent at Mineral.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

The output of the Witwatersrand mines, now at work, for the month of July was 149,179 oz. fine gold, an increase of 6,399 oz. over June. For the seven months ending July 31 the total output was 806,021 oz. fine gold, or \$16,660,454. In 1901 operations were only begun in May, and the total return up to July 31 was 53,216 oz. fine gold, or \$1,099,975. All returns from the Transvaal are now made in fine gold.

AUSTRALIA.

NEW SOUTH WALES.

Broken Hill Proprietary Company.—This company reports the output from its refinery for the four weeks ending August 13 at 374,791 oz. of silver, 4,452 tons lead and 41 tons hard (antimonial) lead.

QUEENSLAND.

Mount Morgan Gold Mining Company.—This company reports for the month of July 16,734 tons ore treated by chlorination, the yield being 12,291 oz. gold; an average of 0.74 oz. per ton. The working is still limited by the short supply of water.

TASMANIA.

Mount Lyell Mining Company.—This company reports for the four weeks ending July 23 a total of 24,250 tons of ore smelted. The yield was 571 tons black copper, containing 565 tons fine copper, 53,831 oz. silver and 1,791 oz. gold. The average yield was 2.33 per cent. copper, 2.22 oz. silver and 0.07 oz. gold per ton.

WESTERN AUSTRALIA.

Great Boulder Perseverance.—This company's report for July shows that 1,833 tons oxidized ore and 10,492 tons sulphide ore were worked, a total of 12,325 tons. The yield was 16,017 oz. gold, an average of 1.3 oz. per ton.

CANADA.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rosland Ore Output.—The shipments for the week ending August 16 are scarcely up to the standard from delays in handling ore at the Northport Smelter. The output was: Le Roi, 4,200 tons; Le Roi No. 2, 1,400; Giant, 120; White Bear, 20; total for week, 5,740 tons; for year, to date, 196,628 tons. The feature of the week is the forwarding of a car of ore from the White Bear mine. Work has been under way continuously for almost a year.

ONTARIO—ALGOMA DISTRICT.

(From Our Special Correspondent.)

Copper Queen.—There are 15 men at work on this property, and they have a shaft down 70 ft. On account of bad ventilation this shaft was abandoned, and a drift has been driven 200 ft. in to meet the shaft. This work has been now accomplished, and there is a rumor to the effect that the company will build a track to the mine to connect with the Rock Lake Railway, some 8 miles away.

Grace.—The Algoma Commercial Company, Limited, is pushing the work of the erection of a stamp mill at this gold property, and it is expected that it will be in working order in a few weeks.

Josephine.—Work is also being rushed in connection with this iron mine by the Algoma Commercial Company. The sinking of the shaft is progressing as fast as possible.

Manxman.—A meeting of the shareholders of the company controlling this gold mine was held a few days ago, and reports from F. Fischer, of South Kaukauna, Wis., were submitted. It was decided to proceed with the installation of a stamp mill to cost \$15,000. The property is situated to the north of the Michipicoten River, consisting of 640 acres.

Mariposa.—The development work required by the Mines Act has been completed, and further work is now in progress by the new company.

Ophir Gold Mine.—This mine has been shut down for some time, but it is reported that it will shortly be reopened and work carried on again.

Rock Lake.—The vein has been traced, it is said, for three miles, and the company has lately acquired the property adjoining, belonging to McLeod, the man who discovered the original Rock Lake property. The shaft is now down 420 ft.

ONTARIO—RAINY LAKE DISTRICT.

Long Lake.—The old shaft on H. W. 575, near Wabigoon, has been timbered, and further sinking shows the quartz to be the whole width of the shaft. Camps are being built.

Royal Sovereign.—Hugh D. Alston has informed the Wabigoon Star that development work is being pushed vigorously. The ore is showing up well.

MINING STOCKS.

(Complete quotations will be found on pages 297 and 298.)

New York.

Aug. 27.

Copper shares are lethargic, as traders are awaiting an improvement in the metal market. Consequently we find stock sales of the leaders for the week less than would have been considered only a moderate day's dealings about a year ago when prices were also much higher. Speculators are quiet just now, apparently not caring to take hold until vacation time is over. Meantime Amalgamated hovers between \$66 and \$67½, while Anaconda shows further weakness, selling at 102 per cent. (\$25.50). At this rate the market value of Anaconda has depreciated about 45 per cent. in one year. The curb coppers showed a little more attention as their supporters are again in town. Greene Consolidated, of Mexico, changed hands at \$26¼@27; Tennessee at \$16¼; White Knob, of Idaho, at \$23@24; British Columbia, \$6@6½, and Montreal & Boston, \$3½@3¾.

The Colorado list is neglected, as the old Cripple Creek gold dividend payers are suffering from unfavorable influences in the Western market. The Leadville stocks are not offering freely as mining operations in the district are good, and a large output is expected this year. Elkton and Isabella, of Cripple Creek, both former dividend stocks, sell at the same price, although a year ago the former brought fully twice as much as the latter. In both cases manipulation has been active, causing a heavy depreciation in the market value of the properties. To-day Elkton brings 38c., as against \$1.76 at the same time last year, and Isabella 38c., as compared with 54c. Up to date Elkton has returned in dividends over 56 per cent. on an outstanding capitalization of \$2,500,000, and Isabella, 33 per cent. on \$2,250,000, showing that they have been among the best paying properties in Cripple Creek. Iron Silver, of Leadville, appeared at 81c., which is somewhat better than last year. This stock, of which 500,000 shares are issued, is closely held, and so sales are rarely made on the open market. Since incorporation the company has paid dividends equal to 25.5 per cent. on a capitalization of \$10,000,000, but no distribution has been made in nearly 2 years.

With regard to the Comstock shares, it is interesting to note that the market value of 9 properties—Best & Belcher, Comstock Tunnel, Consolidated California & Virginia, Crown Point, Hale & Norcross, Mexican, Ophir, Potosi and Yellow Jacket—dealt in here, amounts to only \$824,496, which is equal to about 8 per cent. of the \$10,079,200 capital outstanding. It is also noteworthy that 26 Comstock companies have levied assessments this year, aggregating \$369,000, in amounts of 1c. to 20c. per share.

The property and business of the Virginia Iron, Coal and Coke Company is to be restored and the receiver discharged. The plan as announced by the adjusting committee, consisting of ex-Governor Levi P. Morton, E. J. Berwind, Grant B. Schley and Henry K. McHarg, is as follows: The Virginia & Southwestern Railroad Company, all the bonds and stocks of which belong to the Virginia Company, is to issue \$2,000,000 in 5 per cent 100-year gold bonds and \$1,000,000 full paid stock, which is to pay the obligations of the receivers on the loan of \$1,000,000 negotiated by them, the obligations secured by the mortgage of the Virginia Company to the Morton Trust Company amounting to \$575,000 and interest, and other accounts, so that when the receiver shall have been discharged and the adjustment plan consummated, there will be no mortgage liens on any of the property of the Virginia Company other than the lien of the mortgage to the Manhattan Trust Company, securing bonds outstanding to the amount of about \$7,000,000 and the lien of the mortgage of the Virginia and Tennessee Coal and Iron Company, due March 1, 1904, amounting to \$100,000, and the lien of the mortgage of the Carter Coal and Iron Company to the Continental Trust Company, securing bonds outstanding for \$585,000 principal.

The New York stock exchanges will be closed from Saturday, August 30, to Tuesday, September 2, in order to celebrate Labor Day.

Boston.

Aug. 26.

(From Our Special Correspondent.)

There has been little or nothing doing in copper shares until to-day, when prices were a shade firmer, with some animation, but not enough to give much encouragement, nor to call for extended comment. Any strength in Amalgamated brings a spasmodic effort to stiffen prices in the copper share list, but the buying is a sort of hand-to-mouth affair, and attracts little attention. Sentiment has changed somewhat, and is inclined to be optimistic among those who venture an opinion.

Fluctuations in the standard stocks have hardly been more than \$1 during the week. Shannon settled \$1.12½ to \$9.87½, and Centennial has lost 75c. to \$17.50. Utah Consolidated has varied from \$21.50

to \$20.50, and some selling of Santa Fe has occurred at \$1.75. Bingham Consolidated slid off \$1.50 to \$30 on stop orders and closes there. Lawson's Trinity fell 75c. to \$11, but quickly recovered. Osceola has varied from \$55 to \$56.50. It comes from the Lake that there is considerable dissatisfaction among holders of this stock there with the management. The Lake holdings are said to be quite large.

United States Coal and Oil has been steady at \$16.75@17.50. The market for this stock is said to be a natural one, and without inside support, although the large holders would be willing to support any upward movement. The stock certainly has the confidence of the trading element. United States Mining is steady around \$21, and occupies about the same position.

Dominion Iron and Steel came in with 12½c. of touching \$80, but slid off to \$74.50, with subsequent recovery to \$79.50, and the last sale to-day was at \$77.75. There seems to be two factions in this stock over the border, Montreal people not being in accord with the Toronto bullish views on the stock. The report that \$5,000,000 new stock is to be issued is thought to be a fact, but premature as yet. An issue of \$100,000 preferred stock is announced by the United Zinc Companies to pay for 2,675 acres of mineral land. One new for four old shares held will be offered with a bonus of 20 per cent. of common stock.

Colorado Springs.

Aug. 22

(From Our Special Correspondent.)

The market developed an incipient brokers' boom which culminated on August 19, since which date prices have gradually gone back and settling to about where they were a week ago. There is, however, a good tone to the market which is the result of a gradual improvement which has been going on for some weeks past. Isabella was the star this week, advancing from 33c. a week ago to 38¼c. on Tuesday, dropping back to 35c. to-day. The cause of the advance was the opening of a rich but narrow seam of ore in the 11th level on the Buena Vista vein near where the bonanza shoot was opened three years ago.

Elkton was carried from 33c. to 38¼c. by the boom, closing fairly strong to-day at 35c. The company has reduced its working force to 40 men. El Paso showed considerable strength during the week, advancing from 62c. to 65¼c., closing at 64¼c. yesterday, when the last sale was made.

A reported strike in the 800-ft. level of the Gold King Mine sent up the quotation on these shares to 35c. bid, 60c. asked. The stock is closely held and is very little traded in. The first shipment of ore from Cripple Creek was made from this mine 11 years ago.

Salt Lake City.

Aug. 23.

(From Our Special Correspondent.)

The week has been one of surprises and entirely satisfactory ones. The amount of sales would indicate a return of the former active days. The scale of prices, except in a few instances, has remained about the same as last week, but the amount of shares has doubled. Many things have turned the tide, but among the most important strikes made are those of the Comstock, Wabash and California, all of Park City. The Wabash has had a phenomenal rise in price, having sprung in a few hours from \$1.35 to \$3.25, and in three days only 3,910 shares came out on that raise. This would seem to denote the holders were in possession of some inside facts. The Comstock has held around \$1.20@1.24, with sales of 10,000 shares. California has hit the pace of 86,900 shares and advanced to 32½c. from 22c. At the opening Silver King has handed out 225 shares, for which the buyer paid \$20,000 in one lump. Daly Judge has been doing business at the usual prices, \$11@10.65, with sales of 1,052 shares. Daly West markets 735 shares at \$52.60@51.25. The Majestic of Milford, Beaver County, has appeared on the open board and gets from \$2.95@3.10 per share. Creole, the long silent Park City concern, has opened fire again, selling 1,000 shares at 17¼@16¼c., while Ingot, of Mercur, has sold at 12@8¼c., placing 58,500 shares.

It is gratifying to see the whole list hold steady with no losses, while the excitement on the specials was on.

San Francisco.

Aug. 23.

(From Our Special Correspondent.)

Business on the Exchange has been quiet, with rather a lower range of prices. There has been no incident worth recording. Caledonia was for the time leader of the market, being quoted at \$1.25@1.35. Consolidated California & Virginia was quoted at \$1.25@1.30; Ophir, \$1.10@1.15; Confidence, 80c.; Silver Hill, 50c.@55c.; Overman, 25c.; Potosi, 20c.; Yellow Jacket, 14c.; Crown Point, 8c.

On the Oil Exchange business was quiet and trading light. Sterling sold at \$1.40; Twenty-eight, \$1.25; Oil City, 13c. The heaviest dealings were in Oil City.

COAL TRADE REVIEW.

New York.

Aug. 28.

ANTHRACITE.

The strike continues practically unchanged so far as action is concerned, though there has been the usual flood of talk from all parties. The so-called conference of the coal company presidents, held in New York this week, apparently resulted in nothing, as we are told that the operators are still waiting developments, and that "Mr. Morgan refuses to interfere." Our Scranton correspondent reports elsewhere some indications of a start, but nothing definite has been done. Several washeries are in operation, but their output is small and is all of the steam sizes. There is no production of the larger sizes. We are now in the fifteenth week of the strike, and it is extraordinary that no incident is to be reported.

Meantime stocks at seaboard points are very low. In New York the burning of soft coal in factories and office buildings is so general as to excite little remark. Boston is in the same condition and Philadelphia very little better off. There are no wholesale prices to be given in New York. Retail prices for house coal are up to \$12, or even over, according to relations of dealer and customer; and dealers generally refuse to sell more than the buyer is forced to have. Talk of concealed stocks has almost died out, its futility being too evident.

BITUMINOUS.

The shortage in car supply and the extremely slow transportation from mines to tide have made coal scarcer than it has been in the last few weeks. This has had the effect of advancing speculative prices to \$3.50@3.55 per ton for Clearfield coal. The impression prevails in the trade that prices will go somewhat higher; but this will depend on the question of car supply and quick or slow transportation. Some of the producers are endeavoring to get out of the way the shoal-water port contracts they now have on hand. A difficulty to be contended with will be the scarcity of vessels for this business when the anthracite mines are working full again. We hear of a few contracts being filled at this time.

The labor question in the bituminous regions seems to be quietly settling itself by the men gradually going back to work. Outside of the New River region there are few mines idle, and we understand that the properties in this district are slowly resuming work.

Late dispatches report that the strike in the Jellico District in Kentucky and Tennessee has been settled. The miners receive a small advance and sign an agreement for a year. Work will be resumed September 1. The strike has been rather a protracted and troublesome one.

Trade in the far East is comparatively easy, though the leading consumers where ice makes early are endeavoring to get in their coal supply as fast as possible.

Trade along the Sound is short of coal and producers are making an effort to supply this locality.

New York harbor trade is calling for considerable coal, and there is slowness of shipment upon orders in hand owing to the irregular arrivals of coal at tide.

The all-rail market is considered a little short of coal, though some of the consumers have fair stocks ahead. The car supply is extremely variable, running from 25 per cent. to 90 per cent., the railroads excusing themselves with the statement that the excursion business and the excessive ordinary freight movement have interfered with traffic.

Transportation from mines to tide has been very poor, coal taking 1 to 2 weeks to run through, where it should take only 3 or 4 days.

Vessels in the coastwise market are in a slightly better supply. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 55@60c.; Boston and Salem, 65@70c.; Portland, Portsmouth and Wareham, 70c.; Bath and Gardiner, 75c., with towages to last port; Lynn, Newburyport, Saco, 80c., and Bangor, 85c. Rates from the further lower ports are 5@10c. above these figures.

Birmingham.

Aug. 25.

(From Our Special Correspondent.)

No change is reported in coal production in Alabama, and mines which have been in operation since the settlement of the differences between miners and operators are having large outputs. The production will commence to show decided improvement about the middle of next month, when several new mines will be in a position to commence shipment of coal, and some of the old mines undergoing repairs will be in shape for work. At Mobile and Pensacola no little amount is used by the shipping interests. A good price obtains. Among the mines to be ready for operation about the middle of September will be the Lehigh Coal Company's mines, in Blount County; the Davis Creek Coal and

Coke Company's mines, in Tuscaloosa County; Mine No. 2, belonging to the Tennessee Coal, Iron and Railroad Company, at Blockton, Bibb County; small mines in Jefferson County and elsewhere.

The railroads are not supplying all the cars necessary for a prompt handling of the product. The general traffic on the railroads is exceedingly heavy, and all the cars are in use. There is not any too much locomotive power, and at several places coal is not being moved as quickly as is wished for.

Preparations are being made to increase the capacity for producing coke by the erection of several hundred more ovens in this State. This will require a larger amount of coal, but coke is in strong demand and brings a healthy price.

Chicago.

Aug. 25.

(From Our Special Correspondent.)

In general the wholesale trade in bituminous coal is very good; dealers express satisfaction over the situation and the outlook. There is still trouble with the transportation part of the business; the scarcity of cars is by no means past and the general change caused by the adoption of a per diem charge for cars amounts virtually to a revolution in the case of the small dealer who has been accustomed to make cars his storage bins. Large dealers, however, express the belief that the new per diem system will in the end prove beneficial, and that it will be liked by the trade as soon as everybody has become used to it.

Demand is better than it has been for many weeks, owing to the diminution of the anthracite stock and consequent increased demand for the best grades of bituminous. Retail dealers have put up the price of anthracite until it is now \$9@10 a ton throughout the city. The wholesale price for the few sales made is still \$5.90. In explanation of their action the retailers are pleading the fact that they are making comparatively little profit out of bituminous retail sales and they must get even somehow.

Quotations are practically as last week: West Virginia splint, \$3.50; Yonghiogheny, \$3.30; smokeless Pocahontas and smokeless New River, \$3.75; smokeless nut, \$3.25; smokeless run-of-mine, \$3; Indiana block, \$2.55; Indiana semi-block, \$2.10; Clinton lump, \$1.80; Indiana lump, \$1.90; Hocking, \$3 for city and \$3.20 for country; Southern Illinois run-of-mine, \$2@2.20; Northern and Central Illinois, \$1.80@2; blacksmith's coal, \$3.25@4. The demand is especially good now for Hocking and for smokeless coals.

Cleveland.

Aug. 23.

(From Our Special Correspondent.)

The coal situation is deplorable in this district. The lake shippers have been importuning the railroads to move the material more rapidly, but they have been unable to do so. The result is that with any quantity of vessels ready to move the material up the lakes the shippers cannot use them. The lake docks are therefore filled with boats waiting for cargoes and others are going to the head of the lakes in ballast because they could not be chartered in the coal trade. The reports that have been made of late indicate that the movements during August so far have been anything but satisfactory and earlier in the year it was expected that this would be the banner month of the season. The domestic supply of coal is very low and it is now said that no institution in Cleveland has a 30 hour's supply in case there should be a sudden cessation of receipts. Those who are depending upon the coke supply are in a similar predicament, all of the Valley furnaces having been shut down and the three in Cleveland being threatened with banking at almost any time, although keeping in blast until now. Perhaps not in years has the coal outlook been less favorable than today.

Pittsburg.

Aug. 26.

(From Our Special Correspondent.)

Coal.—Trade has suffered quite severely from the inability of railroads to handle all the coal that could be mined. Lake shipments have been taken care of only fairly well, while many Pittsburg mills are getting less coal than they need and there is a possibility of some having to shut down. The roads are unable to handle empties. While the trouble is generally blamed on a lack of motive power, on account of orders for new locomotives being delayed in execution, the fact really seems to be that there is not enough main line and siding track. It is certain that locomotives do not get a chance to do their work properly, trains of empties and loaded cars being frequently held up for long periods. While circular prices of coal are unchanged, the shortage has caused large premiums, running to 35c. or more a ton, to be paid for prompt lots.

Coke.—Shipments of coke from the Connellsville and adjacent regions last week were ex-

tremely poor, as bad as at any time since the blockade of last fall, and this week shows scarcely any improvement. During last week there was an average of about 10 furnaces banked out of the 33 in the Mahoning and Shenango valleys and about the same conditions prevail this week. Shipments to Pittsburg have also been poor, but the local furnaces generally have stocks, from which they are drawing. While the railroads are making desperate efforts to move coke, there is little hope of any great improvement until the close of lake navigation. The *Courier* reports production in the Connellsville Region at 251,346 tons, a gain of 100 tons over the previous week, the Lower Connellsville region producing 42,455 tons, a gain of 240 tons. Shipments were 11,911 cars from the Connellsville and 957 cars from the Lower Connellsville region. Furnace coke remains at \$2.25 at ovens on contract, but \$4 and even higher is being bid for spot coke, without resulting in sales, as there is practically no spot coke offered.

It is now believed that the Wabash Railroad, which is building an extension to Pittsburg, to be running by the middle of next year, will tap the Connellsville coke region also, which would be a great benefit to the coke shippers as the facilities of the roads now entering the region seem to be entirely inadequate.

San Francisco.

Aug. 23.

(Special Report of J. W. Harrison.)

During the week there have been the following coal arrivals: three from British Columbia, 11,196 tons; two from Oregon, 1,070 tons; four from Washington, 5,900 tons; one from Hull, England, 600 tons; total, 18,766 tons. The amount delivered during the week shows a falling off, still there is ample for all requirements. Wholesale dealers report sales to be fair, with quotations unchanged. The shipping list from Australia shows three or four new names added, but the selling price at this end shows but little improvement, whereas, the actual cost landed here has been advanced about five per cent., on account of the increased rates of freight now ruling. The condition of affairs in British Columbia shows no improvement. Shipments from there are diminishing, and will continue to do so until they are enabled to deliver their output here at lower figures. This can only be done by a shrinkage in the rates of wages paid to laborers, and lower freights for transmission to the market. Seventy-five per cent. of the larger consumers have already modified their power producing methods, from coal to oil, and the only chance of retaining the remaining 25 per cent. will be by low-priced coal. The recent changes made by some of our ocean going steamers, from coal to oil, have been somewhat successful, but not to the extent that many of the journals have given out to the public.

Prices.—Our special correspondent reports prices for Coast coals to dealers as follows: Wellington and Southfield, \$8; Roslyn, \$7; Seattle and Bryant, \$6.50; Coos Bay, \$5.50; White Ash, \$5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, \$8.50; Colorado anthracite, \$14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, \$14; Cumberland, \$12; Welsh anthracite, \$13; cannel, \$11.50; Brymbo, \$7.50; Wallsend, \$7.

Scranton, Pa.

Aug. 26.

(From Our Special Correspondent.)

Superficially there is no apparent change in the strike situation here. Yesterday the struggle entered upon its fifteenth week, the only incident of note in connection with this fact being President Mitchell's return from Chicago. Although apparently there is no change, absolutely and relatively there has been substantial progress made by the operators within the past two weeks. In this locality there are five mines at least in which considerable quantities of coal are daily cut. Some of this is run through the breakers, especially at the Oxford, but the greater part of it has not yet been hauled to the surface.

Operations were resumed last Saturday at the Brisbin washery with a full force of men. This washery has been a long time idle—was in fact abandoned—as the culm dump was believed to be smouldering to the very center. However that may be, there is sufficient culm which has not been touched by fire to keep men and machinery going for a considerable time.

Practically every washery in the Lackawanna Valley in this vicinity is now being operated without hindrance by the strikers. The greater part of their product is absorbed locally. Some has been already shipped to tidewater, but that can afford little relief.

Within the past few days a very large number of coal cars and gondolas have been placed upon the sidings of the Pig & Whistle, belonging to the New York, Ontario & Western Railroad. Some barricades have also been put up, perhaps more as an indication that interference will be resented than

from any apprehension of trouble. Although no official information could be had on the point it is said upon good authority that coal will be mined at this colliery during the week or on Monday next and that all brought to the surface will be run through the breaker and shipped.

Every indication points to the fact that the operators will make a general and simultaneous effort to work the mines within a short time in this section. It would, however, it is believed, be hardly wise to do so until the oratorical effervescence of the Labor Day demonstrations has spent itself.

The miners are no longer relying either upon the relief fund or political intervention. They are waiting simply to see what will turn up within the next week or two. Although there have been isolated cases of intimidation and violence, the miners who have returned to work have little to complain of in that way presently. This is an infallible indication that the strikers in the majority of instances are prepared and willing to resume work when they have a decent pretext for doing so.

Foreign Coal Trade. Aug. 28.

Export trade here continues dull, owing to the continuance of the anthracite strike and the absorption of bituminous coal here in place of the anthracite usually consumed. No change is probable under present condition.

Exports of coal and coke from Great Britain for the 7 months ended July 31 are reported as below, in long tons:

	1901.	1902.	Changes.
Coal	24,035,052	24,015,675	D. 19,377
Coke	433,174	343,130	D. 90,044
Briquettes	603,393	639,911	I. 36,518
Totals	25,077,619	24,998,716	D. 78,903

In addition to these exports there were 8,533,457 tons of coal, etc., sent abroad for the use of steamers engaged in foreign trade, against 7,361,137 tons in the same 7 months of last year; an increase of 797,320 tons.

At a meeting of brick-makers recently held in Bremen, a comparison of the various tenders showed that British coal could be supplied cheaper than German, and a large number of tile and brick manufacturers determined to obtain their supplies entirely or partly from England, and the manufacturers of Bremen, Oldenburg and Hanover have formed a company for the purpose of supplying themselves with British coal, and a committee has been appointed to take the necessary preliminary steps.

Messrs Hull, Blyth & Co., of London and Cardiff, report under date of August 15 that the general tone of the Welsh coal market is firm, and the best descriptions of Cardiff and Monmouthshire coal, as smalls, are difficult to obtain for prompt shipment. Prices show little alteration. Quotations are: Best Welsh steam coal, \$3.90@4.02; seconds, \$3.84; thirds, \$3.60; dry coals, \$3.66; best Monmouthshire semi-bituminous, \$3.42@3.48; seconds, \$3.24; best small steam coal, \$2.34; seconds, \$2.10; other sorts, \$1.98.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2.5 per cent discount.

Mediterranean tonnage is not quite so plentiful, although rates are still at a very low level. Eastern freights are very firm. Some rates quoted from Cardiff are: Marseilles, \$1.10; Genoa, \$1.02; Naples, \$1.02; Singapore, \$3.48; Las Palmas, \$1.38; St. Vincent, \$1.56; Rio de Janeiro, \$2.94; Santos, \$3.24; Buenos Aires, \$3.24.

IRON TRADE REVIEW.

NEW YORK, Aug. 28.

Our local reports show fully the condition of the market at producing and distributing centers. One feature this week is renewed pressure for early deliveries, prices for which are irregular, the premiums paid depending upon buyers' necessities. Another is the short supply of coke reported from the Central West, where a number of furnaces have been banked or have reduced their output. This is due entirely to the inability of the railroads to handle the coke cars.

Birmingham. Aug. 28.

(From Our Special Correspondent.)

The production of pig iron in Alabama and in the Southern territory as a whole has not been reduced any of late, statements to the contrary notwithstanding. Reports from various quarters of the Southern producing territory show that the shipments, which have been equal to the production, have been quite satisfactory. The Sloss-Sheffield Steel and Iron Company, with 6 furnaces in operation, has been making more than its usual output of iron, while the Tennessee Coal, Iron and Railroad Company is not far behind its regular output. The Woodward Iron Company, the

Alabama Consolidated Coal and Iron Company, the Woodstock Iron Company, the Tutweiler Coal and Iron Company, and the other manufacturing concerns, including the Republic Iron and Steel Company, make healthy reports, and, as far as can be ascertained, the production is quite large. There is a little difficulty being experienced in this district by shiftiness of colored labor around the furnaces, and the furnace managers have their hands full watching this. The raw material supply in this district is sufficient except as to coke, and this will have to be managed as well as possible until from 300 to 500 more ovens are constructed. Coke from the outside is now being bought.

President J. C. Mabin, of the Sloss-Sheffield Company, when spoken to on the subject of the pig iron market, replied that very little concern was being taken now as to present conditions. He was speaking for his own company, as it is out of the market. Several furnaces belonging to others have also been withdrawn from the open market. The Republic Iron and Steel Company is said to be anxious to fill orders rather than to get any new business. Mr. Mabin has been giving the pig iron industry much study and is an authority.

It is considered very significant that no efforts are being made to get business beyond June 30, 1903. This would mean that the market is going to be strong during the entire year 1903.

Quotations are still strong. Spot iron, which is a scarce article except with the smaller producers, is bringing \$22 still. The regular quotations place No. 1 foundry iron at \$18 per ton, with No. 2 foundry at \$17@18 per ton; No. 3 foundry is quoted at \$16, while No. 4 is listed at \$15@16; gray forge, at \$14@14.50. Nos. 1 and 2 soft are quoted at the same prices mentioned for Nos. 1 and 2 foundry iron. Charcoal iron, a little of which is made in this State, is quoted at more than \$23. Spot charcoal has sold as high as \$25 per ton.

There is still much activity in finished iron and steel circles. The heat in this section has been very oppressive recently and has had some effect on the labor at the rolling mills and steel plants. At the rolling mills the men employed about the rolls have felt reluctant to work with thermometers ranging around 95 or 100 degrees. At the steel wire, rod and nail works, at Ensley, especially, there has been much trouble felt on account of the heat. The foundries and machine shops report steady work.

Chicago. Aug. 25.

(From Our Special Correspondent.)

The market for pig iron continues very active and prices show a constant tendency upward. There is no disposition toward conservatism apparently on the part of either buyers or sellers of iron, despite the fact that coke supplies are running desperately short and foundries are reported closed from many parts of the district supplied with both iron and coke from Chicago. "After us the deluge" is apparently the thought of buyers and sellers alike.

Prices are from 50c. to \$1 a ton in advance of those of last week. Quotations are as follows, for delivery after April 1, 1903: No. 1 Northern, \$24@25; No. 2 Northern, \$23.50@24.50; No. 3 Northern, \$23.50@24; No. 1 Southern, \$22.65@23.15; No. 2 Southern, \$22.15@22.65; No. 3 Southern, \$21.65@22.65. On deliveries before April 1 there is the same premium of \$1 to \$2 a ton and for delivery within a month almost any price would be gladly paid; snap lots are said to have been disposed of in the last week at near \$27. Lake Superior charcoal in small lots brings \$28.

Coke sells at \$6.50@7 now and the scarcity of it has caused many Western foundries and a few furnaces (none of the furnaces in Chicago) to close temporarily. All coke in market is Connelville.

Cleveland. Aug. 26.

(From Our Special Correspondent.)

Iron Ore.—The first advances in the rates of carriage have been made during the past week. Ore shippers have been compelled to pay 60c. between Escanaba and Ohio ports and one cargo has been placed from the head of the lakes at 80c., although this rate has not been generally adopted so far. There are evidences, however, that the market is on the up grade and improvements are expected from now on. The rates are 75c. from the head of the lakes; 65c. from Marquette, and 60c. from Escanaba. Selling prices have not been changed, although very little is being done. They are: Bessemer old range, \$4.25; non-bessemer old range and bessemer Mesabi, \$3.25; non-bessemer Mesabi, \$2.75.

Pig Iron.—The market generally is strong with buying heavy for next year's delivery, but with little being done in foundry grades for the remainder of this year. The prices are still on the increase and the evidences are all pointing toward

an advance to that point where the buyers will not feel disposed to take any large quantities of material. Present prices are ranging around \$25 for No. 2 foundry and future prices range about \$22. Many of the furnaces in the Valleys have been compelled to bank their fires on account of the shortage of coke and this is further decreasing the available amount of iron. It is evident therefore that the price policy of the producers is not likely to change for some time, unless perhaps under very severe outside pressure, which is not expected. Basic producers are selling for the second quarter of next year at \$20, Valley furnace, and off basic for spot delivery at \$20.50. Bessemer producers are making no sales.

Finished Material.—The sale of plates has been so heavy of late that about all of the material which the larger producers can turn out has been sold up for the first half of next year. The fortunate part of it is that most of the consumers have covered their needs and that few will suffer for the lack of material. There will be a few, however, who will be subject to the demands of the smaller mills which are asking the present prices for material for next year's delivery. Most of the material for future delivery has been sold on the old association price of 1.60c., Pittsburg, while spot sales are made at the premium price of 2@2.10c. at the mills. The strongest feature of the market, however, is the fact that all sales have been specified ahead for the entire year. The same condition prevails in the structural steel trade, where the selling has covered almost the entire output for the first half of next year and the orders have been specified upon already. The association mills are still adhering to the agreed price on the future material and are asking 1.60c., Pittsburg. The smaller mills have sold no material for delivery past the first of January. They are getting 2.75@3.25c. for what steel they have for immediate shipment and ask the same prices on their product for the first half of next year. This week one consumer came upon the market and asked for ship material for five boats to be delivered during the coming winter, but this was refused, since the mills are so tied up already that they have nothing left over. The mills have taken a 3,000 ton order from the city of Cleveland for a crib that is to be built in the lake. The steel rail trade has been a little heavier this week and one local railroad placed an order for 2,000 tons. Other orders came in which required delivery during the first quarter of next year, but the larger mills were compelled to throw them over since the capacity is too nearly sold up. The rail mills are expecting to have to carry over a number of this year's contracts and consequently are taking new orders sparingly. The sheet trade is about as it has been, galvanizing sheets being a drug on the market, while there is a fair demand for black sheets. The prices reflect the difference in the market conditions. Galvanized sheets are quoted at 3.10c. for No. 37, and 2.10c. for No. 10, as base prices, while black sheets are quoted on the old basis of 2.35@2.50c. for No. 10 as a basis for all gauges. The bar iron trade is rather dull, large rounds being scarce, but the smaller sizes being plentiful.

Philadelphia. Aug. 27.

(From Our Special Correspondent.)

Pig Iron.—The only change in the situation is that there are more small buyers coming in for early deliveries. Much of this business is not being placed as sellers have their own trade to look after and are not taking up with new customers.

Billets.—Eastern consumers of billets are ready to buy, but the slight weakening in quotations reported from Western Pennsylvania has induced two or three large consumers here to wait a little longer. There is no change in quotations.

Merchant Bar.—There is quite a run for small lots by local consumers.

Sheet Iron.—The sheet iron market has quieted down.

Skelp Iron.—Offers of portions of contracts from the West have been received here.

Merchant Steel.—Quiet prevails this week.

Pipes and Tubes.—Quite a demand for small lots of tubes broke out this week, mostly for delivery within our own territory.

Plates.—A great deal of business is in sight this week, mostly from small consumers. The little business that got through was done at a premium. Plates are quoted at 2@2.10c. for universals; flange, 2.15@2.25c.; charcoal No. 1 flange, 3c.

Structural Material.—Very little new business has been closed for this week owing to the inability of manufacturers to comply with stipulations. Some small contractors are in a tight place

owing to their neglect in placing orders when they should. Structural material ranges from 2¼ to 2½c. in a small way.

Old Rails.—Sales in small lots were made this week at \$25 for iron.

Scrap.—Heavy steel scrap is wanted and the very little that changed hands went at \$21. The cheaper grades are moving as fast as they can be had at prices ruling for a month past.

Pittsburg. Aug. 26.

(From Our Special Correspondent.)

Interest in the iron and steel situation hinges largely on the matter of coke supply, so much pig iron production being lost by the furnaces not getting coke. Since the early part of last week the Valley furnaces have not been turning out more than half their usual production, and furnaces in Southern Ohio and the Chicago District are also seriously affected. An average of 10 furnaces have been banked in the two valleys since early last week, the remainder not getting out their full product. The furnaces are all falling still further behind in filling their orders and are not able to sell any iron at all for the balance of this year, unless they take it from other customers. Some iron is being offered at second hand.

Finished material continues rather quiet, nearly all the activity being in plates, rails and structural material for delivery in 1903. The mills have accumulated a good line of orders in these products. Inquiry is a little better in bars and sheets, but not much activity is expected before the middle of next month.

Pig Iron.—Sales of pig iron have been of much smaller volume the past week than for several weeks past. Most of the large foundry interests have covered for their requirements for the first half of next year, and the smaller ones are not ready to take hold. Many furnaces have withdrawn from the market and the irregular working of stacks for some weeks past makes consumers feel that even if they did buy the iron they might not get the deliveries called for. In bessemer iron there has been a little selling for the first quarter of next year, one lot of 5,000 tons being sold at \$21, Valley, for the first four months, and another lot of 1,000 tons for the first quarter at \$21.50. These sales establish new high prices on bessemer pig for 1903 and represent an advance of fully 50c. a ton. There is no bessemer to be had for this year. Foundry iron is now quiet. Southern No. 2 is \$18, Birmingham, or \$22.15, Pittsburg, but No. 3 can be bought at \$16.50, Birmingham. There is none available for this year. We quote Northern No. 2 foundry at \$24@ \$25 for quick shipment and \$22@ \$22.25 for next year. Gray forge is very quiet and prices are easy, as the furnaces have been making an unusual proportion of forge iron lately. Basic iron is in considerably better supply than bessemer. The Carnegie Steel Company in the last few days bought a round lot of Virginia basic for delivery the latter part of the year at \$21, delivered Pittsburg. Small lots of similar iron are offered for quick shipment at slightly higher figures.

Steel.—The market on billets, slabs and sheet bars continues extremely quiet. There is scarcely any to be had for quick delivery and for late delivery consumers are not ready to take hold. We quote billets nominally at \$33@ \$34 for quick shipment and \$31 for extended delivery. Foreign steel is practically dead, billets having been offered at about \$30, Pittsburg, without finding takers. There is no inquiry for sheet bars at the present range of asking prices, from \$32.50 to \$33.

Sheets.—The trade is wondering how it is that prices on black sheets are so well maintained when there is no demand for future shipment. Transactions are confined to small lots for early shipment, which go at the established price of 3c. for No. 28 gauge, and even car-loads can be bought at about this figure. Some of the mills seem to be sold up and are not anxious for tonnage. Until they are better fixed as to a steel supply they are not likely to be aggressive sellers. In galvanized sheets, on the other hand, the market has distinctly weakened lately, and this in the face of a steady advance in the price of spelter, which is now about 5.40c., Pittsburg, representing an advance of about 1c. a pound since last May. In lots of 500 bundles and over galvanized sheets are selling at 75 and 5 per cent. off, or 4.17c., net, for No. 28 gauge, car-loads going at about 75 off. With spelter at 5.40c., the value of the coating of a pound of No. 28 gauge is about 1.08c., indicating that there is no profit at all in the dipping.

Ferro-manganese.—Domestic ferro is practically out of the market, which is depending on English and German supplies. The English ferro, 80 per cent., is held at \$52.50 in large lots, on up to \$55 in very small lots, while German ferro is offered in large lots at \$51.50 to \$51.75.

New York. Aug. 28.

Pig Iron.—Prices for spot iron continue high, though consumers find relief in imports of Scotch and Middlesboro pig. The market is inclined to be quiet, and quotations for delivery this year are largely nominal. Premiums paid for early delivery depend upon buyers' necessities. Some No. 2 Northern has sold at \$23. We quote for 1903 delivery, Northern irons at tidewater: No. 1X, foundry, \$23@ \$25; No. 2X, \$22 @ \$23; No. 2 plain, \$21@ \$22. For Southern iron on dock, New York, No. 1 foundry, \$22@ \$23; No. 2, \$21.75@ \$22.25; No. 3, \$21@ \$21.50. Middlesboro pig has sold at \$18.50, and is quoted at \$19.

Cast Iron Pipe.—The market shows no especial change, 8-in. pipe being quoted at \$34.25, gross ton, at tidewater.

Bar Iron and Steel.—We quote large lots on dock: Refined bars, 1.95@ 2.05c.; common, 1.90c.; soft steel bars, 2@ 2.10c.

Plates.—The market continues very strong and demand pressing. We quote for tidewater delivery in car-loads: Tank, ¼-in. and heavier, 2.05@ 2.30c.; flange, 2.15@ 2.40c.; marine, 2.25@ 2.50c.; universal, 2.05@ 2.25c.

Steel Rails.—The local market is quiet, with quotations unchanged. Standard sections are quoted at \$28, f. o. b. mills for 1903 delivery; light rails, \$30 @ \$35 according to weight.

Structural Material.—Demand is still strong. Some work has been postponed on account of the difficulty of getting steel. Imports of foreign material have been restricted by various conditions imposed by makers. We quote for forward delivery on large lots at tidewater as follows: Beams and channels, 2@ 2.30c.; tees, 2@ 2.25c.; angles, 2@ 2.25c.

CHEMICALS AND MINERALS.

New York. Aug. 28.

Heavy Chemicals.—There is a better feeling all round, as inquiries are resulting in business both for prompt and forward shipment. Prices are firm. We quote domestic chemicals per 100 lbs., f. o. b. works, as follows: High-test alkali, in bags, 85@ 90c., for prompt shipment, and 77½@ 82½c. for forward; caustic soda, high-test, \$1.90@ \$1.95 for early delivery, and \$1.85@ \$1.87½ for futures; bicarb. soda, ordinary, 95c.@ \$1.00, and extra, \$3; sal soda, 65c.; chlorate of potash, \$7.75; bleaching powder, off-test, \$1.35—best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90c.@ 92½c.; caustic soda, high-test, \$2.25; sal soda, 67½@ 70c.; chlorate of potash, \$10.25@ \$10.75; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.62½@ \$1.70.

Acids.—Jobbers are doing the most business, and in sulphuric acid are shading the combination's schedule prices.

Quotations per 100 lbs. are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars) delivered in New York and vicinity.

Blue vitriol . . . \$4.60@ \$5.00	Oxalic, com'l. . . \$4.60@ \$5.00
Muriatic, 18 deg. . . 1.50	Sulphuric, 50 deg.,
Muriatic, 20 deg. . . 1.62½	bulk, ton. 13.50@ 15.50
Muriatic, 22 deg. . . 1.75	Sulphuric, 60 deg. . . 1.05
Nitric, 36 deg. . . . 4.00	Sulphuric, 66 deg.,
Nitric, 38 deg. . . . 4.25	bulk 18.00@ 20.00
Nitric, 40 deg. . . . 4.50	Sulphuric, 66 deg. . . 1.20
Nitric, 42 deg. . . . 4.87½	Sulphuric, 66 deg.,
	bulk 21.00@ 23.00

Exports of copper sulphate from Great Britain in the 7 months ended July 31 were 38,264 long tons, against 34,114 tons in the corresponding period last year, showing an increase of 4,150 tons, or about 12 per cent.

Brimstone.—Odd sales on spot are reported at \$24 @ \$24.50 per ton for best unmixed seconds, while shipments held at \$22.25@ \$22.75. Best thirds are about \$1.50 less than seconds. Business is uninteresting. Imports of brimstone into Great Britain in the 7 months ended July 31 amounted to 14,250 long tons, which, compared with 11,759 tons last year, shows an increase of 2,491 tons.

Pyrites.—Demand continues brisk and prices are strong. Imports of pyrites into Great Britain in the 7 months ended July 31 amounted to 374,402 long tons, against 397,241 tons in the same time last year, showing a decrease of 22,839 tons, or about 6 per cent.

Quotations are f. o. b. Mineral City, Va.: Lump ore, \$5 per ton, and fines 10c. per unit; Charlemon, Mass., lump, \$5, and fines \$4.75. Spanish pyrites 13c. to 13½c. per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent. of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—The fertilizer trade has been buying more freely, causing prices to strengthen all round. Spot gas liquor is selling at \$3@ \$3.02½ per 100 lbs., while shipments are quoted at \$2.90@ \$2.95.

Nitrate of Soda.—Firm, especially for this season's shipments. Ocean freights are higher, and the cost of importation to-day is \$1.87½@ \$1.88 per 100 lbs. Importers are therefore holding for higher prices, which are expected in the near future. These quotations also hold for shipments up to April and May, 1903, while for the last half of next year importers are asking \$1.82½, which price could probably be shaded on actual business. Sailings from Chile since last mail advices are the *Hughenden*, with 13,650 bags, and the *Induna*, with 52,650 bags. The *Valentia* arrived at New York with 38,000 bags.

Phosphate.—Quiet this week. High-grade Florida rock shows larger exports than last year, while land pebble is doing its best business at home. Tennessee rock is also improving in domestic demand, although a fair foreign consumption is still noticeable. South Carolina rock shows a slightly better demand abroad. Recently a charter was taken from Coosaw, S. C., to Granville, France, at 12s. (\$2.88).

The shipments of phosphates from the Mt. Pleasant District in the 6 months ended June 30 are reported at 172,675 tons, the bulk of which was entered for domestic consumption. Compared with the corresponding period last year there is a decrease of 24,063 tons, or over 12 per cent., due chiefly to the small exports in 1902.

Shipments of Florida phosphates from Tampa, in the 7 months ended July 31, were 213,565 tons pebble, and 30,090 tons high-grade rock, making a total of 243,655 tons. This total compares with 216,449 tons last year, thus showing an increase in 1902 of 27,206 tons, or 12.6 per cent., principally in land pebble phosphates. The largest shippers this year were the Palmetto Phosphate Company, with 86,465 tons, or 36 per cent of the total reported above, Joseph Hull, with 47,316 tons, and the Land Pebble Phosphate Company, with 36,340 tons. The bulk of the shipments were for domestic consumption, though a good quantity went abroad.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (78@80%) . . . \$6.50@ 7.00	6¼@ 6½d.	\$6.88@ 6.88	\$6.88@ 6.88
* Fla. land peb. (68@73%) . . . 3.00@ 3.25	4¼@ 5d.	6.85@ 7.00	6.85@ 7.00
† Tenn., (78@82%) export. . . 3.25@ 3.50	5½@ 6d.	8.58@ 9.36	8.58@ 9.36
† Tenn., 78% domestic. 3.00			
† Tenn., 73% domestic. 2.75@ 3.00			
† Tenn., 70@72% domestic. . . 2.10@ 2.25			
‡ So. Car. land rock. 3.25	4¼@ 5d.	5.67@ 6.30	5.67@ 6.30
‡ So. Car. river rock. 2.75@ 3.00			
Algerian (63@68%) 5¼@ 6½d.		7.15@ 8.13	7.15@ 8.13
Algerian (53@58%) 4¼@ 5d.		5.32@ 5.58	5.32@ 5.58

*Fernandina, Brunswick or Savannah. †Mt. Pleasant. ‡On vessels, Ashley River.

Liverpool Aug. 14.

(Special Report of Joseph P. Brunner & Co.)

There is a steady trade in heavy chemicals, while prices are practically unchanged.

According to the Board of Trade returns, exports of bleaching powder and soda for July are as follows: Bleaching powder—Shipments to United States, 57,542 cwts.; shipments to other countries, 19,924 cwts.; total 77,466 cwts. Soda ash, 114,544 cwts.; caustic soda, 116,804 cwts.; bicarbonate soda, 33,245 cwts.; soda crystals, 16,649 cwts.; salt cake, 65,974 cwts.; other sorts, 31,177 cwts.; total, 378,393 cwts.

As compared with the corresponding month last year there is a slight falling off in the total exports of bleaching powder, although for the United States alone the shipments are heavier. In sodas shipments show a considerable increase over July, 1901, principally in caustic soda and bicarbonate. Soda ash is firm at the usual varying prices as to market, and there is a fair amount of business passing all the time. Nearest spot range for tierces may be called about as follows: Leblanc ash, 48 per cent, £5 15s.@ £6; 58 per cent, £6 2s. 6d.@ £6 7s. 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s.@ £4 10s.; 58 per cent, £4 10s.@ £4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals find a ready market and are generally quoted at £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda is moving off pretty freely at full prices. We quote: 60 per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is featureless. For hardwood, £6 12s. 6d.@ £6 15s. per ton net cash is quoted, with special quotations for Continental, and a few other export markets. Chlorate of potash is offering sparingly at 3d. per pound net cash. Bicarbonate of soda is in demand at £6 15s. per ton, less 2½ per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages; also special quotations for a few favored markets.

Sulphate of ammonia is steady on spot at about £12 5s.@ £12 7s. 6d. per ton, less 2½ per cent for

good gray 24@25 per cent in double bags, f. o. b., here, but except for shorts covering there is not much going on.

Nitrate of soda is in limited request, and spot value may be called about £8 12s. 6d. @ £8 15s. per ton, less 2½ per cent for double bags, f. o. b., here.

METAL MARKET.

New York. Aug. 28.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in July and Year.

Metal	July.		Year.	
	1901.	1902.	1901.	1902.
Gold:				
Exports....	\$2,875,120	\$7,670,808	\$32,396,346	\$27,947,040
Imports....	4,076,113	1,694,421	20,004,083	14,781,765
Excess. I.	\$1,200,993	E. \$6,076,387	E. \$12,392,263	E. \$13,165,28
Silver:				
Exports....	\$3,938,747	\$3,671,814	\$32,272,749	\$26,190,848
Imports....	2,562,073	2,456,547	17,697,339	14,677,286
Excess. E.	\$1,276,674	E. \$1,215,267	E. \$14,575,410	E. \$11,522,563

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending August 27, and for years from January 1, 1902, 1901 and 1900:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...		\$36,560	\$743,422	\$13,074	E. \$690,758
1902 ...	24,513,808	1,596,012	16,777,431	822,727	E. \$8,899,500
1901 ...	25,799,808	2,042,122	21,420,176	2,569,047	E. 42,608,849
1900 ...	36,360,455	1,706,213	26,026,894	3,391,811	E. 57,309,325

There were no gold exports this week; the silver went chiefly to London. Imports were in small parcels from the West Indies and Central and South America.

Financial Notes of the Week.

Business continues active, though the anthracite strike remains a drawback to progress in trade. Otherwise conditions are good. Money continues to go out from New York, as usual at this season; but no further gold exports are reported.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending August 23, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts.....	\$817,402,300	\$887,837,400	\$918,687,900
Deposits	910,356,300	968,149,600	948,269,800
Circulation	28,586,000	29,007,600	32,414,900
Specie	173,531,200	182,926,600	171,562,200
Legal tenders.....	75,690,800	77,258,900	75,248,600
Total reserve.....	\$249,228,000	\$260,185,500	\$246,810,800
Legal requirements.....	225,339,075	242,037,400	237,067,450
Balance surplus.....	\$23,888,925	\$18,148,100	\$9,743,350

Changes for the week this year were: Increases of \$309,800 in circulation, \$724,200 in specie, and \$2,616,750 in surplus reserve; decreases of \$10,460,100 in loans and discounts, \$11,976,200 in deposits and \$1,101,500 in legal tenders.

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 made with the holdings at the corresponding date last year:

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd.	\$182,926,600	\$171,562,200		
England	195,355,925	187,315,110		
France	490,218,530	\$224,250,925	525,081,695	\$224,477,705
Germany	174,210,000	71,155,000	185,670,000	68,670,000
Spain	70,015,000	85,290,000	71,095,000	97,375,000
North Ids	31,255,000	27,894,500	24,251,500	33,047,000
Belgium	15,290,000	7,645,000	15,313,335	7,656,665
Italy	79,260,000	9,615,000	80,760,000	10,480,000
Russia	346,910,000	36,770,000	368,180,000	44,300,000

The returns of the Associated Banks of New York are of date August 23 and the others August 21, as reported by the Commercial and Financial Chronicle cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market continues dull and featureless with only slight fluctuations in quotations.

The United States Assay Office in New York reports receipts of 33,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to August 14 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£4,903,310	£3,947,445	D. £955,865
China	398,685	135,850	D. 262,835
The Straits.....	79,976	70,550	D. 9,426
Totals	£5,381,971	£4,153,845	D. £1,228,126

Receipts this week were £159,000 from New York, £9,750 from the West Indies, £4,000 from Chile, and £15,000 from Australia; total, £187,750, all in bar silver. Shipments were £22,000 to India and £23,500 to China; total, £45,500, in bar silver.

Indian exchange has been somewhat weaker, in view of the abundant supply of money in India, and the Council bills offered in London brought an average of 15.91d. per rupee.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$0.40	\$0.42
Peruvian soles and Chilean pesos.....	38½	42
Victoria sovereigns.....	4.86	4.88
Twenty francs.....	3.86	3.88
Twenty marks.....	4.76	4.80
Spanish 25 pesetas.....	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

August	Silver			Copper			Spelter			
	Sterling E. change	N. Y. Cts.	London Pence.	Lake Cts. per lb.	Electrolytic per lb.	London £ per ton.	Lead per lb.	N. Y. cts.	St. L. cts.	
22	4.87	52½	24½	11¼	11¼	51½	28½	4.05	5.50	5.25
23	4.87	52½	24½	11¼	11¼	51½	28½	4.05	5.50	5.25
24	4.87	52½	24½	11¼	11¼	51½	28½	4.05	5.50	5.25
25	4.86½	52½	24½	11¼	11¼	51½	28	4.05	5.50	5.25
26	4.86½	52½	24½	11¼	11¼	51½	28	4.05	5.50	5.25
27	4.86½	52½	24½	11¼	11¼	51½	28	4.05	5.50	5.25
28										

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c lower than these figures.

Copper.—The market remains quiet and dull, although it is reported that buyers are showing more interest at the low prices, but are not yet ready to place larger orders. What business has been done appears to have been closed at somewhat lower prices. Consumption is very heavy and stocks in the hands of manufacturers are disappearing rapidly, so that a better demand is looked for in the near future. We quote Lake copper at 11¼c.; electrolytic, in cakes, wire bars and ingots at 11¼c.; in cathodes at 11c.; casting copper at 11¼c.

The London market, which closed last Thursday at £51 16s. 3d. for spot and £52 3s. 9d. for three months, has been very quiet. On Monday and Tuesday it ruled at about £51 2s. 6d. for spot and £52 for three months, but by Wednesday it eased to £51 10s. for spot and £51 16s. 3d. for three months.

Refined and manufactured sorts we quote: English tough, £55@£55 10s.; best selected, £55 5s.@£55 15s.; strong sheets, £68; India sheets, £66 10s.; yellow metal, 6d.

Exports of copper from New York for the week ended August 26 were: Great Britain, 270 tons; Germany, 195; Holland, 885; France, 1,458; total, 1,808 tons. Imports were 25 tons copper from Japan.

Imports of copper into Great Britain for the 7 months ended July 31 were as follows, in long tons, the totals being stated in the approximate equivalent of fine copper:

	1901.	1902.	Changes.
Copper ore.....	54,782	56,981	I. 2,199
Mtite and precipitate.....	52,012	43,901	D. 8,111
Fine copper.....	38,922	63,625	I. 24,703
Total, fine copper.....	70,406	91,273	I. 20,867

Of these imports the United States furnished 558 tons of ore, 9,889 tons matte, and 10,939 tons fine copper, against 481 tons, 10,767 tons, and 12,315 tons, respectively, in the corresponding 7 months of 1901.

Tin.—The market has ruled rather quiet throughout the week, the business done having been more or less in a retail way. Spot tin is quoted at 28c.; September at 27¼@27½; October, 27½@27¾.

The London market, which closed last Thursday at £126 10s. for spot and £122 15s. for three months has ruled lower earlier in the week, but recovered somewhat toward the end. It was £125 5s. for spot and £121 for three months on Monday and Tuesday, and on Wednesday £125 10s. for spot and £122 for three months.

Imports of tin into Great Britain for the 7 months ended July 31 are reported as below, in long tons:

	1901.	1902.	Changes.
Straits	13,477	15,358	I. 1,881
Australia	1,563	1,901	I. 338
Other countries.....	3,621	1,626	D. 1,995
Total imports.....	18,661	18,885	I. 224
Re-exports	3,031	3,217	I. 186
Balance	15,630	15,668	I. 38

The net imports therefore show only a small difference this year.

Lead.—The market is unchanged at 3.97½@4.05c. St. Louis, and 4.05@4.10c. New York.

From abroad the quotation for Spanish lead is cabled as £11@£11 1s. 3d.; English 5s. higher.

Imports of lead into Great Britain for the 7 months ended July 13 are reported as below, in long tons:

	1901.	1902.	Changes.
United States.....	26,496	33,871	I. 7,375
Spain	54,069	58,203	I. 4,134
Australia	36,903	34,866	D. 2,037
Other countries.....	7,570	9,449	I. 1,879
Total imports.....	125,038	136,389	I. 11,351
Exports	23,185	19,887	D. 3,298
Balance	101,853	116,502	I. 14,649

The lead credited to the United States is chiefly Mexican lead, refined here in bond.

Spelter.—The demand for spelter continues unabated, and we learn that a large business is being done both for early and distant shipment. We quote St. Louis 5¼c.; New York 5½c.

The foreign market has again advanced 5s., good ordinaries being quoted at £19 2s. 6d.; specials 5s. higher.

Imports of spelter or metallic zinc into Great Britain in the 7 months ended July 31 were 55,746 long tons, as against 37,660 tons last year, showing an increase of 18,086 tons, or nearly 50 per cent. Re-exports this year were 5,054 tons, against 5,011 tons in 1901—an increase of 43 tons.

Antimony.—We quote Cookson's at 9¼c.; Hallett's at 8c.; Hungarian, Italian, Japanese and U. S. Star at 7¾c.

Nickel.—The price is now quoted by leading producers at 40@47c. per lb. for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quantity, runs as high as 60c. per lb.

Platinum.—Consumption continues good, and prices are firmer. Ingot platinum in large lots brings \$19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities is worth 73½c. per gram.

Quicksilver.—The New York price continues \$48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotations are \$45.50@46.50 per flask for domestic orders. For export orders \$44 per flask is quoted. The London price remains £8 15s. per flask, with the same figure quoted from second hands.

Imports of quicksilver into Great Britain in the 7 months ended July 31 were 2,374,441 lbs., against 2,485,004 lbs. last year, showing a decrease of 110,563 lbs. in 1902.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.	
Aluminum.....	33@37c.	Ferro-Tungsten (37%).....28c.	
No. 1, 99% ingots.....	31@34c.	Magnesium	\$2.75
No. 2, 90% ingots.....	4c. up	Manganese, pure (N. Y.).....	.60c.
Rolled sheets.....	20@23c.	Mangan'e Cop. (20% Mn).....	.32c.
Alum-bronze	33@39c.	Mangan'e Cop. (30% Mn).....	.38c.
Nickel-alum	\$1.50	Molybdenum (Best).....	\$1.52
Bismuth .....	.80c.	Phosphorus .....	.50c.
Chromium, pure (N. Y.).....	.50c.	Copper, red oxide.....	.70c.
Copper, red oxide.....	.50c.	Sodium metal.....	.50c.
Ferro-Molyb'dum (50%).....	\$1.25	Tungsten (Best).....	.62c.
Ferro-Titanium (10%).....	.90c.		
Ferro-Titanium (20@25%, N. Y.).....	.55c.		

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

Average Prices of Metals per lb., New York.

Month.	Tin.		Lead.	Spelter.		
	1902.	1901.		1902.	1901.	
January	23.54	26.51	4.000	4.350	4.27	4.13
February	24.07	26.68	4.075	4.350	4.15	4.01
March	26.32	26.08	4.075	4.350	4.28	3.81
April	27.77	25.93	4.075	4.350	4.37	3.88
May	26.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.00	4.075	4.350	4.96	3.99
July	28.38	27.85	4.075	4.350	5.27	3.95
August	26.78	25.31	4.075	4.350	5.27	3.99
September	26.23	25.31	4.075	4.350	5.27	4.08
October	26.67	26.07	4.075	4.350	5.27	4.23
November	24.36	24.36	4.075	4.350	5.27	4.30
December	24.36	24.36	4.075	4.350	5.27	4.31
Year	26.54	26.54	4.075	4.350	5.27	4.06

Average Prices of Copper.

Table with columns for Month, Electrolytic, New York, Lake, London Standard, and prices for various months from January to December.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper.

Average Prices of Silver, per ounce Troy.

Table with columns for Month, London, N. Y., and prices for various months from January to December.

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

DIVIDENDS.

Table with columns for Name of Company, Date, Per Share, Total, and Total to Date, listing various companies and their dividend details.

ASSESSMENTS.

Table with columns for Name of Company, Location, Delinq., Sale, and Amt., listing companies and their assessment details.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Almaco, Anaconda, and others with their prices.

*Per cent

Coal, Iron and Industrial Stocks.

Table of stock quotations for Coal, Iron and Industrial Stocks, listing companies like Am. Agr. Chem., U.S. Steel, etc.

Total sales, 447,306 shares.

† Ex-Dividend.

BOSTON, MASS.*

Table of stock quotations for Boston, Mass., listing companies like Adventure Con., Allouez, and others with their prices.

* Official Quotations Boston Stock Exchange. Total sales, 57,489 shares. † Ex-dividend.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alkali, Mich., U.S. Steel, etc.

§ Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 31,837 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Am. Con., Anaconda, etc., with columns for par value, high/low prices for various dates, and sales.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 438,813 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs (By Telegraph) listing companies like Acacia, Alamo, Am. Con., etc., with columns for par value, high/low prices, and sales.

MEXICO.

Aug. 16.

Table of stock quotations for Mexico listing companies like Durango, Guanajuato, Angustias, Pozos, etc., with columns for shares, last dividend, bid/ask prices, and sales.

ST. LOUIS, MO.* Aug. 23.

SPOKANE, WASH.* Aug. 21.

Table of stock quotations for St. Louis, Mo. and Spokane, Wash. listing companies like Am. Nettie, Catherine Lead, Central Coal, etc., with columns for shares, par value, bid/ask prices, and sales.

*From our Special Correspondent.

Total sales 45,000 shares. *Reported by Hunner & Harris.

LONDON.

Aug. 16.

Table of stock quotations for London listing companies like Anaconda, Copiapo, De Lamar, etc., with columns for authorized capital, par value, last dividend, and quotations.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

PARIS.

Aug 7.

Table of stock quotations for Paris listing companies like Acieries de Creusot, Boleo, Anzin, etc., with columns for country, product, capital stock, par value, latest dividend, and prices.

SALT LAKE CITY.* Aug. 23.

TORONTO, ONT. Aug. 26.

Table of stock quotations for Salt Lake City and Toronto, Ont. listing companies like Ajax, Ben Butler, Bullion-Beck, etc., with columns for shares, par value, high/low prices, and sales.

All mines are in Utah. *By our Special Correspondent. Total sales, 174,078 shares.

Total sales, 19,500 shares.