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THE TOTAL value of the mineral and metal products of the United States in 1901 is given in Volume X of *The Mineral Industry*, now completed, at \$1,376,826,102. This sum, great as it is, represents only the raw material; that is, the metals and minerals as made ready for market, and not the varied forms into which they are manufactured. Moreover, it is the value at the mine or place of production, and does not include the cost of transportation or delivery to consumers. The figures give some idea of the magnitude and importance of the mineral industry of this country; its full extent and variety can only be realized by a study of the volume in detail.

✕

THE SHIPMENTS of iron ore from the Lake Superior region in August reached the great total of 4,078,311 long tons, exceeding those of August, 1901, by 476,306 tons. For the season from the opening of navigation up to August 31 the shipments were 17,051,330 tons, a gain of 4,788,094 tons over the corresponding period last year. With over two months of open navigation to be expected, there is now little doubt that the total for the year will exceed 25,000,000 tons, even if we make all necessary allowances for a falling off in the closing weeks of the season and for inevitable delays at the Lake Erie receiving docks. This exceeds by 1,000,000 tons the estimates made at the opening of the season of the probable shipments.

✕

IT IS, PERHAPS, hardly necessary to call attention to the suggestion with regard to assays for gold and silver in copper-bearing material made by Dr. A. R. Ledoux in our correspondence column. Apart from the influence which the writer's long experience and standing naturally gives to his communication, it seems to us that the proposed agreement as to the kind of assay to be used is highly desirable. Uniformity of practice in this respect offers many advantages, not alone to the chemists, but also to the producers and refiners. A clear understanding, either established by general custom or required by special agreement, would prevent the disagreements which arise from time to time, and would certainly result in the better satisfaction of all.

✕

ADVICES FROM Beaumont, Texas, indicate an early decline in the production, and it is quite evident that the majority of investors in the stocks of the oil companies there will find they have put their money into some very deep holes. This result was only to be expected. History has repeated itself just once more. Unless other developments are made, it is apparent that those who have looked upon the discoveries of oil at Beaumont as solving the fuel oil problem are doomed to disappointment. In fact, unless other fields are opened the use of oil for fuel will decrease rather than increase, and such decrease may be looked for in a short time. At the present time the refineries are capable of absorbing most of the production of Beaumont and Sour Lake as well; the railroads will require all of the surplus and the supply from Jennings, La., leaving none available for manufacturing purposes.

✕

THE EXCEPTIONAL drought in Australia this year is checking the production of many mines. The

Lloyd copper mine at Burrage, in the Bathurst District of New South Wales, is being greatly inconvenienced by the scarcity of water. No rain has fallen since November last, and the Winter rains that are usually expected in July and August, have so far failed. The dam built for the mine has a capacity of 85,000,000 gallons, sufficient to last nine months. As no rain has fallen since November, when the dam was filled, the supply is now running short, and the plant will have to be closed down. The mine and plant have only just been put on a regular basis, and the output is now about 200 tons of copper per month. To be held up by want of water at this juncture is particularly disappointing. The Mount Morgan and other mines in Queensland are suffering from the same cause as those in New South Wales. The report of the Mount Morgan Company, an abstract of which is given elsewhere, shows that it has been necessary to carry water on railroad cars to keep the mill in operation—rather an expensive method, but unavoidable under the circumstances, if work is to be continued.

✕

THE CORRESPONDENCE published in another column shows that the people of the Sudbury District are disturbed by reports that the International Nickel Company intends to draw the greater part of its supply from New Caledonia, and to neglect its Canadian mines. It seems to us that they are unduly excited, since it is clear that even if it wished to do so—and that is not by any means certain—the International Company could not neglect its sources of supply at Sudbury. The New Caledonian properties of the company are but little developed, and suffer, as do all mining interests in the island, from the difficulty of securing labor. This is an acute question in the colony, and operators there are trying to secure laborers from any quarter which may seem available. Some of the previous experiments in this direction have had very unsatisfactory results, and the island does not seem to attract the better class of immigrants of any nation. This cause, if no others, would seem to make the continued operation of the Sudbury mines a necessity. Our Canadian friends, we think, need have no fears for the future.

✕

A CURIOUS issue has been raised by the Canadian Government, and is to be settled by the courts. The issue is with the Dominion Iron and Steel Company, which claims bounty under the law for certain quantities of pig iron made from Canadian ore, and for other quantities of steel made from Canadian pig iron. The Government, however, claims that as the steel was made by the direct process—the molten iron being carried direct to the steel furnaces—no pig iron was actually made; and as molten iron is not pig iron, the steel was not made from pig under the meaning of the law.

To us this seems rather a quibble upon technical terms. The materials of which the steel was the final product passed through all the processes except the actual casting into pig iron and the remelting of the pig. The result was the same as if those parts of the process had been carried out. The steel seems to be entitled to bounty under the spirit of the law, if not its exact terms. It is possible, however, that the court may decide otherwise, and hold the Government to the strict letter of the law rather than the spirit.

MARKET CONDITIONS.

Iron and Steel.—The iron markets show comparatively little change from our last account, and here and there some untimely checks of production are reported as caused by scarcity of coke or delay in delivery at the furnaces and mills. For this reason, and not for any lack of demand, the pig iron production, as indicated by the furnace statistics for September, shows a slight falling off, which will, however, be made up probably before the end of the month. Pressing demand from foundry consumers is being largely met by imports from Great Britain and Germany, and in both of those countries the current markets have been materially helped by American purchases of pig iron and of steel billets. Some finished material, chiefly in the form of rails and sheets, has also been ordered from abroad to cover requirements which our own works could not supply in time.

Copper.—The copper market has been quiet, but the advance in prices has been fairly well held, with only a slight reaction. The disposition continues to be evident in some quarters to depress the market, and a flood of circulars and other literature has appeared, most of it being entirely unworthy of notice. Some business continues to be done, chiefly for next year's delivery, at current prices.

The report of Mr. John Stanton, who acts as statistician for the companies, shows that the total production of the United States in August was 25,296 tons, which is an increase of 2,629 tons over August, 1901. In the eight months to the end of August the United States production shows a total of 192,493 tons, or 14,447 tons more than in the corresponding period last year. The exports from the United States for the past eight months have reached the large total of 122,128 tons, very nearly double that for the first eight months of 1901. The present conditions show that the supply is not at all in excess of consumption and that there is no reason to fear any accumulation of stocks. The statement of current stocks compiled by Dr. Ledoux, which was published in our columns, is being generally accepted by the trade in spite of all the efforts made to discredit it, and there is every reason to believe that it represents the actual state of the case; that is, that there is no accumulation of copper at the present time beyond the normal stocks which must always be carried.

Other Metals.—Tin has been dull and weaker in price, partly owing to the fall on the London markets and partly from an apparent cessation in demand. Consumers do not seem to be taking a lively interest in the market at present, most of them probably hoping for a further fall in quotations.

Lead continues unchanged, with about the usual demand and with no especial incident to note during the week.

Spelter is strong and with prices at about the same level. The ore market shows a little lower price, owing mainly to a determined attempt by the smelters to check any advance.

Silver continues dull and depressed. The demand from the East continues very light, and, while dealers are not pressing the metal on the market, there is nothing to indicate any advance; supplies are not large, and there is no near prospect of better demand. The possibility that a considerable amount of Chinese silver may be offered for sale is also a depressing influence.

Coal.—The Western coal market continues to be dependent almost entirely on transportation. The larger cities are now beginning to prepare for winter, and the railroads are pressed on every hand to hurry deliveries, but do not respond as they ought to. In Chicago and other large cities dealers have given up the hope of replenishing their stock of anthracite, and

there is a corresponding increase in the demand for the better grades of soft coal, which can be used in its place. The Lake trade is still in a bad condition, with every prospect of a block as the close of navigation approaches.

The Seaboard bituminous coal trade continues in an unchanged condition, except that there is somewhat more pressure for supplies from the Eastern ports.

The anthracite trade remains at a standstill, with little indication of an approaching end of the strike. The conditions of this trade are fully treated in another column.

**REORGANIZATION OF BRITISH STEEL WORKS.**

The reorganization of English steel works on modern principles is proceeding rapidly. We have now to record that the firms of Bell Brothers and Dorman, Long & Co., of Middlesborough, are to consolidate their interests and to spend £250,000 on the erection of a modern plant for making structural steel. The firm of Bell Brothers, under the direction of Sir Lowthian Bell, has long been in the forefront of mine and colliery owners and iron and steel producers, and Dorman, Long & Co. are well-known manufacturers of structural steel. The firms have been intimately connected for a long time. Dorman's have always used Bells' steel in their works, and during recent years have acquired half the common stock in Bell Brothers, Limited. Under the present scheme of reorganization, Dorman's are to acquire the remainder of the common stock in Bell Brothers, Limited, in exchange for £225,000 new common shares in Dorman, Long & Co., Limited. An additional £250,000 in common shares is to be issued at par to provide for new plant. It will be seen that by this scheme the two firms are not amalgamated, and, in fact, there are also preference shares and debentures in Bell Brothers, Limited, that will continue in the same ownership as at present; but the control of the two firms will be centered in the hands of Dorman, Long & Co. The board of directors of the latter firm will be composed of members of both firms, with Sir Lowthian Bell as chairman.

It is important to note that at the new steel plant the Saniter process is to be used. This process is a modification of the basic open-hearth furnace, an addition of chloride of lime being made to the charge, with the object of desulphurizing as well as dephosphorizing. The process was invented some 10 or 12 years ago, and in 1893 it was adopted by the Wigan Coal and Iron Company, with very successful results. Some three years ago Mr. Saniter was appointed manager of the steel department at Bell Brothers, as Sir Lowthian Bell saw the possibilities of the process in connection with Cleveland iron ore. For many years now the Cleveland carbonate ores, which originally founded the fortunes of the town of Middlesborough, have been under a ban, and have not been used for steel making. The steel ship-plates made from them were reported unreliable by the officials of both the Admiralty and Lloyds. The causes of this failure have never been fully explained, though naturally much investigation was made. Their condemnation caused north of England steel people to go to Spain and elsewhere for their supply of ores, and, in view of the present difficulties in obtaining new foreign sources of supply, the discovery of a process that will make domestic ores once more available is of great value to the English steelmakers. The steel now made by these firms by the process has satisfactorily passed all tests. In the working of the consolidated firms the chief direction will be in the hands of Messrs. C. L. and Hugh Bell, sons

of Sir Lowthian; Mr. A. J. Dorman and Mr. Panton, manager of Dorman's Steel Works. Sir Lowthian feels that at his age it is necessary to retire from active work. Some time ago Messrs. Hugh Bell and Panton visited the United States with a view of studying the most recent practice, and they have embodied the experience so gained in the design of the new rolling mills.

**THE DUTY OF AN EXECUTIVE.**

If there is any one thing which has been regarded as a chief merit and essential safeguard of American democracy, it is the mutual independence of the legislative, judicial and executive departments, and the correlative duty of each department, not only to abstain from interference in the business of the others, but to attend vigorously to its own.

The duty of an executive officer is to maintain order and enforce law. This principle applies to presidents, governors, mayors, burgesses, sheriffs and chiefs of police alike; and our fathers were jealous in demanding obedience to it. But of late years, we have seen governors and mayors trotting back and forth, to see whether a compromise could not be negotiated with mobs and law-breakers; and we had only last Sunday, the sickening spectacle of Christian ministers, in more than one pulpit, telling the President of the United States that he now had the chance of his life to make himself forever illustrious by settling the anthracite strike in the State of Pennsylvania. The Constitution of the United States may forbid such a performance; but what are constitutions and laws to a conscientious, enthusiastic, sentimental, oratorical soul?

I do not say that inquiry into the merits of a controversy which has involved, or may involve, open and lawless violence is a bad thing. I do not say that attempts to settle it by compromise or arbitration are wrong. They may be wise or foolish, helpful or mischievous, according to circumstances; they are not, *per se*, wicked. What I do say is, that the executive officers who command the police or the military forces of communities or States or the nation are absolutely debarred by their official position from taking direct or indirect part in any negotiations of that sort. Even before violence has broken out, they ought to foresee its probability, and carefully keep themselves free from any embarrassing relations with its incipient cause.

Mayor Low, of this city, for instance, is known as a sincere friend of organized labor, and has served, more than once, as an arbitrator in labor disputes. But this was when, as an eminent citizen not charged with official duty, he could properly indulge his kindly impulses and utilize his wisdom and tact in that way. If a labor dispute should now be brought before him, it would be his duty to say plainly:

"You must seek your friendly mediator and counsel somewhere else. My one duty will be to preserve the public order and safety—whether the strikers, or lawless people taking advantage of the occasion given by the strike, should endanger it. And I cannot afford to hamper myself in the discharge of this duty by assuming any special relation to the strike itself, or to either party concerned. Even the 'merits of the case,' in which, as an individual, I might have been intensely interested, do not concern me as an official now. There can be but one case for me—the case of riot and violence which can have no 'merits' to be properly heard by me."

I have printed this as if it were an actual quotation. Would it had been such in fact! For in these days, words somehow seem to speak louder than actions; actions without words are easily overlooked or forgotten; and our public officers are too apt to discharge their duty silently, and neglect with eloquent and impressive explanations. But, after

all, the deed is more than the rhetoric; and we have had some instances which it is refreshing to remember.

There was Gov. Jeremiah M. Rusk, of Wisconsin, who suppressed a riot with instant and humane severity, to the great surprise of the rioters, who had expected the usual political parleying and paltering on the part of the Executive. "Uncle Jerry" made his speech afterwards; and it ought to make his name immortal. "I seen my duty, and I done it!"

Then there was Governor Roswell P. Flower, of the State of New York, who, when a great railroad strike was inaugurated at Buffalo, ordered to that point, without waiting to inquire or negotiate, practically the whole New York National Guard. Of course, the strikers denounced his action as insulting, and some of the newspapers called it premature. But his businesslike explanation was: "I thought the troops might be needed, and that, if I waited until that was actually the case, I might find it impracticable to send them by rail." And the result was, that the Buffalo strike cost not one drop of blood, because the executive power of the State was overwhelmingly displayed, before, in its absence, the passion of the mob had been so greatly inflamed as to make bloodshed inevitable.

A long series of instances in recent American history might be adduced, to show that, without a single exception, a temporizing and hesitating policy on the part of the Executive has always increased the aggregate cost, in blood, time and treasure, of vindicating the law and suppressing the mob.

President Roosevelt's course in the present case has been, on the whole, praiseworthy. He asked Col. Wright to make an investigation for his information, not as to the merits of the controversy, but as to the facts of the situation, and for the purpose, not of suggesting reforms or remedies, but of determining whether there was anything requiring and warranting the action of the National Executive. It was proper that he should thus seek for light before any possible occasion for Federal interference; and, although his course (shrewdly misinterpreted by labor leaders), gave rise to delusive expectations among the ignorant strikers, it would be hardly fair to charge him with that result. After Col. Wright had made his report, Mr. Roosevelt not only intimated that it furnished no warrant for any meddling on his part, but took pains to say plainly, that whoever resorted to violence in support of a claim for justice lost the right, even to a hearing. Now violence, either imperilling the property or the military defence or the authorized operations of the United States Government, or so far overthrowing the Government of a State as to elicit from its authorities a call for Federal aid, is the only fact that could possibly justify Mr. Roosevelt's interference. All the amiable proposals for future reform which Col. Wright adds to his report are totally irrelevant to the question of the President's duty. In other words, it is not "up to" him to do anything at all.

But it is, as the New York *Sun* has idiomatically said, "up to" the Governor of Pennsylvania. And the Governor of Pennsylvania has made a terrible mistake in consenting to hold, with Mr. Mitchell and other leaders and friends of the strikers, a secret midnight interview, at which no representatives of the other side were present; and the nature and contents of which he refuses to divulge. Mr. Mitchell says the interview was not asked for by him. He simply obeyed an invitation from the Governor of the State—postponing the hour to 1 a. m., by reason of an oratorical engagement, and thereby showing his entire equality, as a potentate, with the said Governor. If this be true, it adds to the not wholly un-

deserved humiliation visited upon Pennsylvania through the Governor's weakness and folly. But Mr. Mitchell has forfeited the right to be believed; and I would not condemn a dog, not to say a Governor, upon his unsupported evidence. The admitted facts are enough. It matters little whether Governor Stone invited this interview, and meekly sat up until the small hours to suit the convenience of the Dictator, or not; the main proposition is that he had, as commander-in-chief of the police and military power of that great State, no business to hold private interviews with anybody, when his only duty was to put down public violence, terrorism and anarchy.

Lawless violence stops discussion. We heartily enforced that proposition against the South in 1861. We have enforced it, over and over again, against the Indian tribes—even when their outbreaks had been caused by wrongs of which they had clear cause to complain. We apply it unhesitatingly to every criminal, not belonging to a labor union, who makes himself witness, judge, jury and executioner, and revenges his alleged wrongs with his own hand. Why should we make an exception, just because there are hundreds of crimes instead of one, and the partly benefited by them pretends to deprecate, but is either unable or unwilling to stop them?

I know that Governor Stone has plenty of plausible excuses. He wants the several sheriffs to certify that they are unable to cope with the mob, before he will interfere. He thinks that a few more brutal murders are necessary to prove that this is the case. He is not willing to put any more of the State troops in places where their mere presence would intimidate rioters and assassins.

How much patience would Jerry Rusk or Roswell P. Flower have had with such excuses? And even if they be sufficient to acquit Governor Stone of the charge of blameworthy inaction, how do they justify his pernicious activity? It is, indeed, "up to Governor Stone"; but is he up to it?

R. W. RAYMOND.



SMALL POTATOES.

THE ENGINEERING AND MINING JOURNAL has received a letter, purporting to come from a committee of the Butte Miners' Union, and threatening it with a "universal boycott," if it continues to give space to "such vipads" as Dr. Raymond; and I have been honored with a similar communication, in which I am vigorously denounced as one who never in my life made a dollar from honest toil, but have been, "with the majority of men," a parasite, "made fat by the honey stolen from the horny-handed busy bees—the meek and humble sons of toil, who receive only about one-eighth of the honey they produce," etc., etc.

The notion that the Butte Miners' Union produces any honey at all, is certainly original. Murder, assault, terrorism, extortion, shirking and disloyalty could be compared poetically to many things; but honey never occurred to me in that connection. On the other hand, I am not familiar with "horny-handed" bees; and perhaps that is the kind of honey made by that kind of bee. If so, I feel sure that no thief of ordinary sense would steal it, and that nobody could possibly get fat on it—so I claim acquittal on that ground alone, without mentioning the superfluous fact that I am not fat!

But perhaps these letters are a hoax. At all events, if they are genuine, they indicate a surprising change in the Butte Miners' Union, and in the Western Federation of Miners, of which it was the parent and is now a part. They were not wont to be so gentle and tame. The last time I was addressed by

their official representatives, they did not content themselves with calling me a "vipad" and a "parasite." They had some courage in those days. Perhaps some of the refugees from the Mollie Maguires of Pennsylvania were still alive among them, to show them how such things ought to be done in style. At all events, they did not call names merely. Any scab could do that. They declared me worthy of death by the usual Butte Union method, and promised me "a free ticket to hell," if I would only show myself in Butte.

I have been in Butte repeatedly since then, and though I have seen what appeared to be the road to hell more openly indicated and advertised in that anion-ridden town than anywhere else in the world, I have never received from agents of the line the summary facilities thus promised to me—in case I were traveling in that direction! So I have got over being awfully scared by such prophetic offers; and, of course, these modern, tame substitutes don't stir my nerves a bit. Why should I tremble, when horny-handed bees call me a "vipad"?

Wake up, Brethren of Butte! Rise to the level of your predecessors. Anything beneath mutilation and murder is unworthy of your proud record! At all events, do not be so silly as to talk about an honest day's work, for that is outside of your experience!

The publishers of THE ENGINEERING AND MINING JOURNAL may be frightened, if they are built that way, by your threat of "universal boycott." I suspect it would not greatly affect their circulation, for people who read that journal are neither such manifold, variegated and transparent fools as you, nor likely to be influenced by your silly advice.

At all events, I know you, through and through—your origin, your history, your brutal crimes, your absurd pretences, your once omnipotent and now waning power; and, unless you have the courage to talk murder, as you used to do, you would be wiser to keep still. For mere entomological objurgations are ridiculously feeble from lips accustomed to threats of a really respectable criminal character.

R. W. RAYMOND.



WINFIELD SCOTT STRATTON.

Winfield Scott Stratton, known here and in Great Britain as the successful operator and owner of Stratton's Independence Mine, died at his home at Colorado Springs, Colo., September 14, after a long illness. Mr. Stratton was born in Jeffersonville, Ind., in 1848, and at an early age learned his father's trade as carpenter and boat-builder. At the age of 20, he went to Kentucky and after a short experience in business there, went westward, living successively for a time in Sioux City, Iowa, Omaha and Lincoln, Neb. In 1872 he went to Colorado in the hope of benefiting his health, he having suffered from lung trouble for some time previously. In Colorado he worked at his trade for several years, took some contracts for building and in a few years saved up some money which he invested in a mine in the San Juan country. The venture was not successful and after spending a year at Silverton, he returned to Colorado Springs where he again worked at his trade, filling up the intervals with prospecting in different parts of Southern Colorado. On July 4, 1891, he located a claim which afterwards developed into the Independence Mine. At that time, however, he did not realize the value of his claim—as very few people in the Cripple Creek District did at that time—and offered to sell it to several parties for a small price; not succeeding in this, he returned to work at his trade, doing assessment work sufficient to hold his claim for a couple of years. In 1893, when the value of Cripple Creek ores began to be realized, he returned to work at his mine and by leasing part of the property, secured

sufficient cash to sink a shaft and do the necessary development work. In a short time he struck the ore shoot which made the Independence Mine famous and did much to launch the Cripple Creek boom.

He continued to work the mine with much success, taking out an amount of money which has been variously estimated, but which was probably not very much below \$1,000,000 a year for several years. In working the property he secured expert assistance and the mine was developed in a systematic and creditable way. In 1899 the main shaft had reached a depth of 900 feet and the different levels, etc., had a total level of not less than 20,000 feet. In that year, after long negotiations, he sold the mine to the Venture Corporation, of London, which organized the British company now owning it. Its history since that time is familiar to our readers.

It is estimated that after closing the sale, Mr. Stratton's fortune amounted to about \$10,000,000. A part of this he invested in other Cripple Creek mines and a large part in real estate in Denver and Colorado Springs. He was particularly attached to the last named place and spent a great deal of money in beautifying it, putting up a number of handsome buildings and making a fine park which he presented to the city. For some time past he had been in failing health. It is possible that his life might have been prolonged had he not been a convert to Christian Science and relied exclusively upon faith-healers and their doctrines for his recovery.

Mr. Stratton's success was one of the few cases where fortune may be ascribed to pure luck. The location of the Independence was merely an incident in his work and for years he never expected the claim to yield more than a few hundred or perhaps a few thousand dollars. He followed the lead of others in the Cripple Creek District and did not begin to work the great mine until he was satisfied of its promise by the success of neighboring claims.

Personally, he was a quiet, modest man, living in a very moderate manner and making no display of the great wealth which he possessed in his later years. He was much attached to Colorado and especially his home in Colorado Springs, which he seldom left except when obliged by business. He never married and the only near relative who survives him is a sister who lives in California.

ALEXANDER R. SHEPHERD.

Alexander R. Shepherd, who died in Batopilas, Mex., September 12, was born in Washington in 1835, being a descendant of an old Maryland family. His father was a lumber merchant in Washington and was supposed to be a wealthy man, but after his death in 1845, his estate was found to be in much disorder and his son Alexander was obliged to leave school at an early age and enter upon active work. He served for a short time in the Army during the war, and then entered actively into politics, becoming president of the Council which then governed Washington. He continued prominent as a member of the council and chairman of the Board of Public Works until 1874, when he was legislated out of office by a change in the form of government. With the many controversies which arose out of Mr. Shepherd's administration in Washington we have nothing to do, nor is this the place to speak of the charges of corruption and extravagance made against the board of which he was the head. Certainly this board did very much to improve the city and make it the modern and beautiful city that it now is.

Mr. Shepherd's career as a mining man began when his political work ended. After his retirement he resolved to begin life over again in a new country and selected as his field of operations the old mining district of Batopilas in the State of Chihuahua, Mexico. He went into that country in 1878 and a year later he organized the Batopilas Mining Company, having interested a number of New York capitalists in his enterprise. Mr. Geo. W. Quintard, of New York, was the president of the company and Mr. Shepherd was vice-president and resident man-

ager. From that time until his death he devoted himself to the management of the mining property which eventually included practically all the mines in the district. These he operated with varied success. At the time when the mines were in bonanza the profits were large; at others the company ran behind and fell into debt, but the deficiencies were ultimately made up. His latest enterprise was the Porfirio Diaz Tunnel which was intended to drain the great volume of water from the upper levels of the mines. This tunnel is now approaching completion and its effect upon the mining district is already evident, as is shown by the report of the company which was recently published in our columns. In the 24 years which he spent in Batopilas he organized a community, building up a town of considerable size, including a residence for himself, the offices of the company and homes for the large number of workmen employed.

The history of the Batopilas Mines is an extremely interesting one. During the colonial days a very large amount of silver was taken from them and they formed one of the prominent sources of the treasure which the Spanish Government drew from Mexico. The mines, however, had been practically abandoned for many years when Mr. Shepherd took



ALEXANDER R. SHEPHERD.

hold of them in 1878. During the 24 years from that time until his death, he remained constantly in Batopilas working out his plans with untiring energy and perseverance. Owing to defects in the original organization of the company, it never had a sufficient working capital and the enterprise had to be carried along mainly upon faith and credit. The proceeds of the several bonanzas struck from time to time were absorbed by the debts which had accumulated and part of the manager's troubles arose from controversies with some of the stockholders who did not appreciate the extent of his plans for the future. In every case, however, Mr. Shepherd succeeded in carrying his point and was practically the sole dictator of the policy of the company. So far as can be judged at the present time a point has been reached where the enterprise is on a paying basis and it is to be expected that substantial profit will be realized in the future. Mexico certainly owes much to him for he has done more than any other man for the development of a great mining district. Whatever judgment may be passed on Mr. Shepherd's work in Washington no one can deny his great energy and ability and his devotion to the work which he had immediately in hand. It is to be hoped that there will be no change in the Batopilas Mines and that the plans for their operation which had been almost completed, will be carried out successfully in the future.

INVESTIGATION OF ARIZONA COPPER DEPOSITS.

Dr. F. L. Ransome has just completed a comprehensive report on the geology and ore deposits of the Globe copper district, Arizona, for the United States Geological Survey. The region is dissected by a remarkable network of faults, of various geologic ages, and the occurrence of the ores is related to some of the older of these fissures. The copper ores hitherto mined in the district have been oxidized and are consequently free from sulphur, but the exploitation of the deeper sulphide ores is yet in its infancy. The district has produced in the neighborhood of 120,000,000 pounds of copper. The greater part of this output has come from the Old Dominion Mine, which has for years been working large bodies of oxidized ore found in limestone occurring by the side of a strong fault.

During the present season Dr. Ransome is to continue the investigation of the copper deposits of Arizona by undertaking a detailed geologic study of the Bisbee District, in which is the well-known Copper Queen Mine.

COST OF REFINING LAKE SUPERIOR COPPER.

According to Charles Kirchhoff, in *Census Bulletin* No. 124, the refineries engaged in the treatment of Lake Superior "mineral" handled 121,243 short tons in 1899, which yielded 157,940,824 pounds of fine copper, the average yield per ton of mineral being 65.1 per cent Cu. The low grade of the mineral is explained by the increasing utilization of the finer slimes of the stamp mills. In other words, the percentage of copper recovered in the ore dressing process is increased at the expense of the grade of the concentrated product. The cost of smelting 121,243 tons of mineral in 1899 was as follows: Wages, \$475,501; superintendence, \$49,703; fuel, \$163,843; supplies and materials (not including cost of mineral), \$195,364; rent, interest, insurance, etc., \$49,368; total, \$933,779. This was \$7.70 per ton of mineral and 0.591 cent per pound of refined copper.

GAS POWER IN BRITISH IRON WORKS.—

A Mond gas plant is to be installed in the Cochrane iron works at Dudley, England. There will be three large gas engines, which will furnish all the power for the works.

BLEACHING POWDER.—The constitution of this important article of commerce and the theory of its formation, as to which chemists hold different views, are discussed by H. Ditz (in *Zeitschrift für Angewandte Chemie*, XV, xxx, 749 to 755), and F. Winteler (ibid, XV, xxxi, 773 to 780). The investigations of the latter arose from difficulties in making bleach from electrolytic chlorine. A gray, slimy mass was produced, containing but little available chlorine and much chlorate and chloride. This was found to be due to carbon dioxide in the gas, arising from the carbon electrodes; the difficulty was overcome by the investigations described in the paper referred to.

COAL IN CENTRAL ASIA.—Coal deposits, which were discovered last year in the Ferghana territory, have been found to cover an extensive area, that is traversed both by the Central-Asian Railway, and also by the line which is now being constructed between Orenburg and Tashkend. In this district, which from its position is secure from competition with foreign coal, there are at present numerous cotton mills belonging to far-sighted manufacturers from Moscow and Lodz, while there are also other industrial undertakings in working order. It is announced that the Imperial authorities intend to mark out this coal region into districts, which, so soon as the geological explorations have been completed, will be leased to private persons at the beginning of next year.

THE ELMORE OIL CONCENTRATING PROCESS.

The Ore Concentrating Syndicate, Limited, which is operating the Elmore concentrating process in England, recently established works near London, where the process of concentration with the assistance of oil is practically illustrated. For the following description and the accompanying illustration we are indebted to the London *Engineer*:

In the operations, as conducted at this plant, the ore is crushed in a stone-breaker, finely pulverized in a Huntington mill, and mixed with water to the consistency of freely-flowing pulp. This pulp is pumped to a higher level and run into the end of a horizontal revolving cylinder where thick petroleum residue also trickles in. The cylinder is provided with a spiral worm extending throughout its length as well as with longitudinal baffle plates, so that while the cylinder revolves the material is carried forward and at the same time is subjected to considerable splashing and agitation, which causes the oil to become temporarily mingled with the pulp, but at the far end of the cylinder the oil-concentrates surge out into a launder in front, which conducts the viscous mass to a settling tank, while the pulp-tailings run through orifices in the cylinder into a hopper and pass to a second cylinder below to undergo similar treatment, which, moreover, is repeated in a

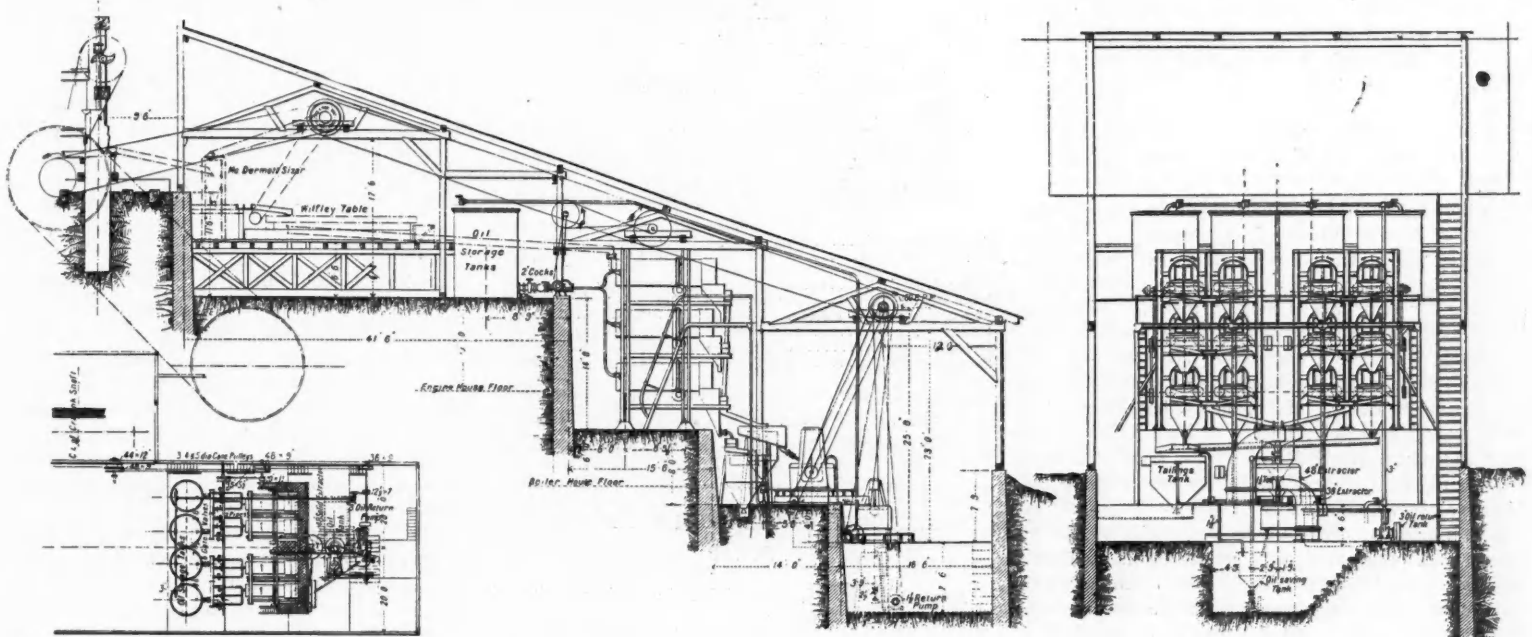
ders are supported on rollers, four to each cylinder, revolving on a fixed axle carried in brackets attached to a framework consisting of six columns in a 2-unit plant, each column being built up of two channel iron girders 19 feet 9 inches high and having a cross sectional area of 8 inches by 3½ inches by 3½ inches. The columns are cross braced by means of 4-inch by 2½-inch channels. The hoods and tanks are supported by horizontal channels of the same size, and the front of the frame carries a platform with a checker footplate for operating the pulp cocks. Each column is fixed into a foot, having a base of 24 feet by 15 inches.

Below, in front, is the oil-settling tank, with a pipe and cock beneath for running the watery layer into the tailings tank, which is placed at a slightly lower level. Above the separation tank is an overflow launder, with delivery pipe and cock leading to the first, the solid centrifugal, which is 48 inches in diameter. Associated with this is a pipe above for taking off the outflowing oil into an oil-saving tank, and a conveyor below for taking the solid concentrates to the second centrifugal extractor, which is perforated and 36 inches in diameter. The oil-saving tank is beneath the second extractor, and from it the oil can be pumped back to the oil-storage tanks at the head of the mill.

they have most successfully separated lead and silver from baryta; and copper, with silver and gold, from spinel, garnets, spathic iron and magnetite. In the two latter cases they say that the separation of the sulphides of copper and iron from the carbonate and magnetic oxide of iron is so complete as to leave the tailings sufficiently free from sulphur and copper to warrant their use as an iron ore.

BAUXITE IN FRANCE.—The Compagnie des Phosphates et Bauxites de l'Ariege owns some important deposits of bauxite, both white and red varieties in the department of the Ariege in France. These bauxites average 65 per cent alumina, while the iron oxide and silica contained are low enough to answer the usual requirements of chemical and metallurgical works. The railroad to Bastide de Sevon, where the mines are situated, has recently been completed, enabling the company to ship the material freely.

AN ELECTRIC FURNACE FOR MAKING STEEL.—The *Electrical World and Engineer* describes an electric furnace for the direct production of steel, the invention of M. Paul Louis Toussaint Héroult, of La Praz, France. The dominant idea of a



ELMORE OIL CONCENTRATION PLANT.

third cylinder placed below the second one. The impoverished pulp ultimately runs into a tank, where any floating oil may be removed, and where, if necessary, the water too may be allowed to clarify sufficiently for re-use. The oil-concentrates are floated off from the top of the settling tank by admitting water below, and are conducted into a centrifugal machine with a solid periphery, where they are whirled, while the temperature is maintained at 300° F., with the result that 3 layers form, of ore, water and oil, respectively. The ore packs round the side, while the oil skims over the water and passes away into a reservoir, to be used again. From the first centrifugal the ore is transferred to a second with a perforated periphery, where a further quantity of oil is expelled, and after this the ore retaining a small quantity of adhering oil is ready for treatment by an extraction process.

The character of the plant can be gathered from the illustration, which shows a side elevation of a unit of plant. The mixing cylinders are 10 feet in length and 3 feet in diameter, and are galvanized throughout after the spirals and baffles have been fixed; the worm has a pitch of ½ foot, 1 foot or 1½ feet, to suit circumstances. In front of the cylinders can be seen the galvanized covers and hoppers, as well as the oil launders, whilst at the back are shown the oil-supply pipes, and also the launder bringing in the pulp to the uppermost cylinder. The cylin-

The cylinders are driven through worm gears operated by fast and loose pulleys, and revolve 6 or 8 times a minute to suit the ore under treatment. Each unit of plant has an estimated capacity of 25 tons of ore per 24 hours, but this varies with the character of the ore treated, and, inasmuch as the two centrifugals are sufficient for a 3 or 4-unit plant, 7 or 8 horse-power is the estimated power for working an oil-concentrating plant of a capacity of 100 tons a day. The plant is substantial, and yet the individual parts are of no great weight, a very desirable factor for most mining districts.

In operation the plant worked quietly, cleanly, smoothly and nearly automatically. It is stated that the loss of oil amounts to 1 gallon per ton of ore treated, although it is sometimes more, sometimes less.

The process is not claimed as suitable for all kinds of ore, but is more particularly prescribed for the treatment of materials that flake in crushing, and would, under ordinary circumstances, be lost as float. Pyrites is said to be eminently amenable to treatment, but not rich ores, than can be easily treated by other methods. The treatment of ores with heavy gangues, that is, which are associated with minerals of high specific gravity, such as baryta, spathic iron, magnetite, etc., always a troublesome problem, is asserted to be solved with ease by this process. The inventors say that among such ores

bessemer converter, swung upon trunnions and fitted with tuyeres, but provided also with electrodes as an auxiliary means for furnishing the heat necessary for maintaining the metal in fusion, reappears in the present device. In the usual converter the heat is derived from the oxidation of silicon, phosphorus and other metalloids present as impurities, and the addition thereto of means for maintaining the heat in the absence of such impurities considerably extends the field of converter operations. The furnace itself is simply constructed; it is of the usual converter form, provided with a lining, pouring lip and chimney, and mounted for oscillation upon combined cog and guide-rails.

The electrodes are two in number, and the arcs are struck in series, thereby avoiding the necessity for an electrical connection to the metal. These electrodes are carried by standards, rigidly attached to the converter, whose movement they share. The terminal connections to the carbons are through a series of copper wedges forced between the carbon and a surrounding metal collar. The tuyeres lead from a wind-chest carried between the base of the converter and the standards. For adjusting the carbons the inventor suggests the use of hydraulic cylinders; the same devices may also be employed for oscillating the furnace. Instead of a lip, the mouth of the converter may be prolonged into a ladle, from which the metal may be cast direct.

THE SUDBURY NICKEL MINES.

BY OUR SPECIAL CORRESPONDENT.

The present season has so far been rather disappointing to the mine owners of the Sudbury District. When the new International Nickel Company, better known as the Nickel Trust, took charge of the business of the old Canadian Copper Company early in the spring, the first move was to close down nearly all the mines and also the smelting works except two furnaces. This unexpected result was not calculated to make the new management very popular at the start. Then the local private agent of the so-called Trust has lately been circulating the report to the effect that the two leading companies, the International and Lé Nickel, intend to get nine-tenths of the future supply of nickel for the whole world from the New Caledonia, and only one-tenth from the Sudbury mines. But the poet Burns tells in very graphic terms what often becomes of the best-laid plans of mice and men, and this bear story is too ridiculous to be taken seriously by any one.

In the first place, the Trust does not control the output of the mines even on the main nickel range, and the great North Range has not been touched yet, and is owned almost entirely by other parties. In fact, the Mond Nickel Company is doing far more now than the Canadian Copper Company and in addition to the Victoria Mine in Denison, which has been opened up under Capt. A. B. Hixon in the most systematic way to an depth of over 500 feet in a massive body of good paying ore, this company is exploiting three other nickel properties in the district, from one of which over 60 tons of ore a day is already being shipped to the smelting works.

The Lake Superior Power Company is also a growing factor in the development of these nickel mines, having recently erected a smelting plant at the Gertrude Mine, where about 30,000 tons of ore is now on the roast heaps, and one furnace has been running for some weeks making matte. Two other furnaces are being added to the works, and the three combined will have a capacity of 400 tons every 24 hours. Besides the Gertrude and the Elsie mines on the main range, this company has acquired a most valuable nickel property at Blue Lake on the east end of the North Range. This mine is located on the top of a conical hill in the crater of an extinct volcano, and remains of the overflows of ore can still be seen around the base of the hill. Similar phenomena occur at various points in the Sudbury District, though nowhere else as well defined as in this case. The ore deposit is of unusually high grade, and has been tested with the diamond drill, showing nearly 100,000 tons of ore within 136 feet of the surface. This property had been condemned as of no value until two keen-eyed prospectors, Foster Shields and Edward Dodd, luckily discovered the ore-bed this season under a deep covering of earth, moss and water. A channel had to be blasted through the rim of the crater to drain the water out.

Two important suits have lately been instituted against the Nickel-Copper Company, of Hamilton, one by C. H. Howland, of Ohio, and the other by Henry Totten, of Toronto, in connection with alleged improper dealings in large blocks of the company's stock. For the want of practical management this company composed of men, who are good honest business men, but without any experience in mining, has naturally been unfortunate from the start in every way.

The Edison party of over a dozen young men from New Jersey, and a similar party of Cornell students under the direction of one of Edison's men of last year, have been exploring for hidden mines during the past three months on the Wahnapiæ end of the nickel belt. They claim to have located a number of ore bodies with the magnetic needle, but the old local prospectors do not believe in this method of searching for nickel mines, and prefer to find more assuring indications with the naked eye.

Near the Height of Land, about 20 miles beyond the north nickel range, and separated from it by a wide granite belt, an extensive range of iron ore was

discovered three years ago by a party of prospectors while looking for placer gold. They actually found a better thing without knowing it, for this season some iron men from Michigan bonded most of the properties, and tested one of them with the diamond drill to a depth of 600 feet, all the way in ore of good quality. So that with the greatest nickel mines in the world, and a contiguous iron belt, the Sudbury District, despite all obstructions, should have a prosperous future before it.

LAKE SUPERIOR TRAFFIC.

The traffic passing through the Sault Ste. Marie Canals this year has been far in excess of that reported for any previous year. In the month of August the total freight was 5,082,398 tons. For the season from the opening of navigation up to September 1 the official report gives the total freight movement as follows, in net tons:

	1901.		1902.		Changes.
	Tons.	Per ct.	Tons.	Per ct.	
Eastbound	13,156,275	81.0	18,163,288	83.9	I. 5,007,013
Westbound	3,979,734	19.0	3,476,102	16.1	I. 396,368
Totals	16,236,009	100.0	21,639,390	100.0	I. 5,403,381

The total number of vessels passed through the locks this year was 14,226, against 11,742 to the corresponding date in 1901. The average cargo, therefore, was 1,521 tons this year, against 1,383 tons last year. It is quite possible that the freight this year may reach a total between 34,000,000 and 35,000,000 tons.

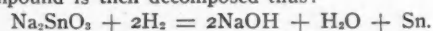
The chief items of mineral freight for the season to September 1 are given below, in net tons, with the exception of salt, which is in barrels.

	1901.		1902.		Changes.
	Tons.	Per ct.	Tons.	Per ct.	
Anthracite coal	389,036		107,608		D. 281,428
Bituminous coal	2,301,981		2,878,659		I. 576,678
Total coal	2,691,017		2,986,267		I. 295,250
Iron ore	10,956,954		15,285,652		I. 4,328,698
Pig and manuf'd iron	89,982		102,358		I. 12,376
Copper	50,823		66,560		I. 15,737
Building stone	23,859		23,132		D. 727
Salt, barrels	271,438		295,853		I. 24,415

The only considerable decrease was in anthracite coal, the reason for which is plain. The most important gain was that of 39.5 per cent in iron ore.

RECOVERY OF TIN FROM TIN PLATE SCRAP

According to H. Mennicke, in *Zeitschrift für Elektrochemie*, 1902, VIII., xxi., 315 to 320, there are nine works in Europe, chiefly in Germany, which use the stannate process, the largest being at Essen. In this process sodium hydrate is electrolyzed into sodium, which decomposes water and separates hydrogen at the cathode, and OH, which oxidizes tin at the anode, forming soluble sodium stannate. The latter compound is then decomposed thus:



The electrolytic bath is originally made up to contain 10 per cent of caustic soda and is used at about 70° C. The temperature and the percentage of free alkali have great influence on the result. The absorption of carbon dioxide from the air must be guarded against, inasmuch as it reduces the conductivity, extends the time required, and causes a precipitation of tin hydroxide, forming a coating on the scrap, which interferes with the solution of the tin. The absorption of carbon dioxide cannot be prevented completely, and as the carbonate increases in quantity the electrolyte must be regenerated. This is done by removing a portion of the solution daily, and treating it first with carbon dioxide to throw down the tin as hydrate, and then after filtration with calcium oxide to convert the sodium carbonate into caustic soda. About 10 per cent of the tin recovered from the scrap is got from this process of regeneration of the electrolyte.

Fresh scrap usually yields about 2 to 3.5 per cent of tin. The electrolytic stripping is stopped when the scrap attains a brown color, at which stage about 0.2 per cent Sn remains undissolved. The best precipi-

tate is obtained when the electrolyte is maintained at 70° C. At higher temperatures there is a tendency toward the deposition of spongy tin, and the metal is more likely to reoxidize than in cooler solutions. When the tin is crystalline, coherent and free from oxide there is no difficulty in melting it, but it may conveniently be pressed first into briquettes. Lead, iron, arsenic and antimony pass into solution and deposit with the tin, wherefore an impure scrap always yields an impure product.

BENZENE LOCOMOTIVES IN MINING.—A benzene locomotive has been used in a mine of the Vereinigten Königs und Laurahütte, in Germany. Its length is 2.6 meters and its breadth 0.98 meter, so that it can be placed easily on the cage and pass with security the safety walls. It is of 8 horse-power, and can be used for the traction of 20 loaded cars each of nearly a ton gross weight. The consumption of benzene for a 10-hour shift is 10 kilograms. The ignition is performed by the electric spark of an accumulator battery.

GERMAN IRON AND COAL COMPANIES.—A Berlin paper has calculated that the share capital invested in German coal and iron companies amounts to \$225,000,000, and the return to the shareholders for 1901 averaged 9.38 per cent, as compared with 13.14 per cent in 1900 and 11.95 per cent in 1899. Of a total of 98 companies 22 were unable to pay any dividend for 1901, while 19 distributed from 1 to 5 per cent, 26 from 6 to 10 per cent, 23 from 11 to 20 per cent, 5 from 21 to 30 per cent, 1 from 31 to 40 per cent, and 2 over 41 per cent.

SAMPLING CALCIUM CARBIDE.—E. Odenheimer (in *Chemiker Zeitung*, 1902, XXVI., lxi, 703 to 704) discusses the precautions that should be observed in sampling calcium carbide. The composition of the commercial carbide is variable, because of the presence of unconverted material and coke. The dust which accumulates at the bottom of the drum is frequently a source of dispute. The proportion of dust, that is material which will pass a 1 mm. sieve, should not exceed 5 per cent. The best method of sampling is to empty each drum on a large sheet of metal, distribute the dust evenly, and take samples of 1 pound each from two places. These drawings are collected in a well closed can and are subsequently mixed thoroughly and carefully cut down. Lots of 100 drums or more can be sampled satisfactorily by drawings from every tenth drum. Owing to the dangerous character of calcium carbide, the sampling should be intrusted only to experienced men, who should wear a respirator during the process.

USE OF MAGNESIUM IN COPPER REFINING.—According to *Oesterreiche Zeitschrift für Berund Hüttenwesen*, (1901, p. 546,) magnesium is now largely employed in Germany as a deoxidizing agent in refining copper for electrical purposes. The magnesium is used in the form of cubes or rods, or else as an alloy of 50 per cent Mg. with 50 per cent Cu.; the latter is the better method, inasmuch as the alloy is taken up by the copper bath without any loss of magnesium, which it is difficult to avoid when the magnesium is used alone. The alloy is added 20 grams at a time, a total addition of 50 grams per 100 kilograms of copper being usually sufficient, although a larger addition, up to 100 grams per 100 kilograms, acts beneficially in improving the strength and density of the copper. The copper after this treatment casts into perfectly solid ingots. Gun metal, brass and bronze may be improved for casting in the same way. The alloy of 50 per cent Mg. and 50 per cent Cu. has a specific gravity of 2.97 and melts at 450° C. It is said that copper and copper alloys, containing up to 5 per cent of magnesium are likely to be of value for technical purposes.

THE EASTERN COAL AND COKE COMPANY'S WASHER AT COKEDALE, KAN.*

By W. R. CRANE.

The commercial coking of coal in Kansas began with the advent of zinc smelters, who were attracted from the point of production—the Galena-Joplin lead and zinc district—westward to the Kansas coal fields, where cheap fuel abounded. Pittsburg, Weir, Scammon and Cherokee were for a time the principal sources of spelter production in the State, but are now abandoned, as the smelters have been moved further west to the natural gas belt, and are now located at Iola, Gas City, Cherryvale, Neodesha, etc.

Stripped, commonly known as "dead," coal, which

mine, no mechanical means of ventilation are employed, a steam jet placed at the mouth of the up-cast being claimed to be all that is necessary to produce sufficient circulation of air in the workings.

A 40 horse-power Erie engine drives the machinery of the washing plant.

A battery of two boilers, having 2 12-inch by 24-foot flues each, furnishes power for both hoister and plant engines.

A Worthington duplex steam pump, with 4-inch suction and 3-inch discharge, draws the water from a pond, which is 1,100 feet distant and 11 feet below the level of the plant. This pump discharges into a large storage tank 20 by 20 feet, placed on trestles,

and causes it to dump. The car may be run on carefully and the tippie operated by hand. When the car is empty the tippie rights itself. From the chute the coal passes to a horizontal trough conveyor, by which it is delivered to the first crusher or set of toothed rolls, which are 3 feet long by 18 inches in diameter. The teeth are 3 inches long and diamond-shaped. The rolls are driven by belts at a speed of 160 revolutions per minute. From the first set of rolls the partially disintegrated coal passes to a second set, provided with corrugated faces, the corrugations being ¼ inch deep and ½ inch apart. This set of rolls is also driven by belts at a speed of 160 revolutions per minute. The shells of rolls in both cases are made of cast iron, chilled, and are furnished in segments to facilitate repairs and also reduce cost of breakage. On passing the second set of rolls the coal passes downward through a chute to the foot of a 34-foot bucket elevator. The buckets travel at a rate of 20 feet per minute. The fine coal is delivered by this elevator to a hopper-shaped storage bin of 20 tons capacity, from which it is fed by chute to a coal jig as desired.

The store bin for the jig supply has a capacity of a few hours only, and is intended to simply tide over in case of accidents to the washing apparatus. As a rule, however, the passage of the coal is continuous from the rolls to the washer, and, in fact, throughout the plant. A cessation of operations at one point causes a complete shutdown except in the mining of the coal.

The Coal Jig.—The jig as a 2 cell, side piston form. A sectional elevation, together with side and end views of a single jig, are given in Fig. 3. The jig tank is made of 3-by-12-inch timbers, placed on edge, grooved and splined and built within rectangular frames of 6-by-8-inch timbers, which are mortised together. The dimensions of the jig are: Height, 12 feet; length, 12 feet; width, 6 feet. The "rougher" portion of the jig; *i. e.*, the part into which the coal first enters, is 12 inches higher than the "finisher" portion—the part receiving the coal from the "rougher." This is to allow a discharge of over-water and coal from the former to the latter. Both sieve cells of the jig are of the same size—3 by 7 feet—while the plunger cells are 3 by 3 feet, being also of the same size. The "rougher" and "finisher" cells together constitute a complete jig. The sieve cells are both furnished with Christian & Reigler parallel brass screens, with 1-32-inch spaces. The plunger cells have wooden plungers 4 inches thick, and make a close but not tight fit with the rub-boards on the sides of the cells. Heavy iron rods

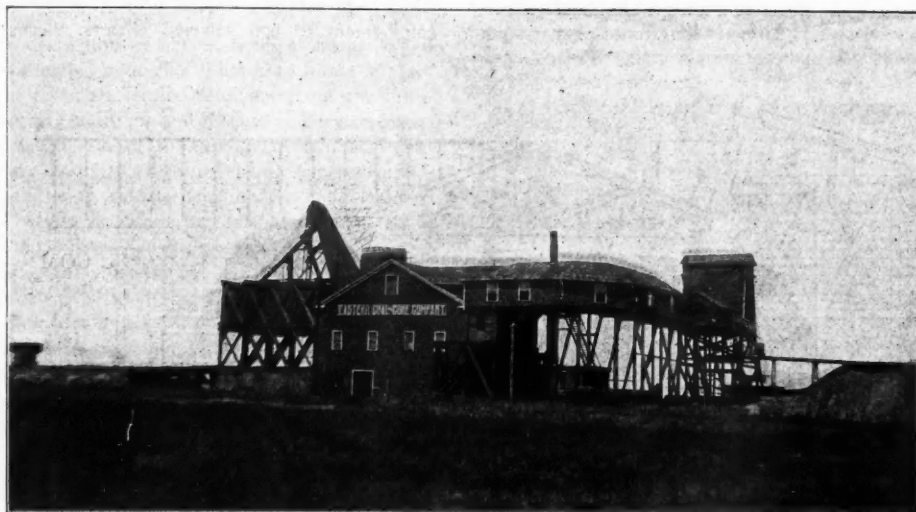


FIG. 1.—COAL WASHER AND COKE OVENS AT COKEDALE, KAN.

is the slacked coal existing near the outcrop of the principal coal strata of this locality, was for a number of years a favorite fuel for the smelters, but for several reasons coke made from slack coal, produced in the district, began to be employed as a substitute for the slacked or "dead" coal. Coke made directly from the slack coal usually contains too much sulphur and other impurities to be successfully employed in smelting operations. To overcome this objection coal washing plants were installed. Coal washers were in times past operated at Weir, Scammon and Cherokee, but have long since been closed down and dismantled.

The only coal-washer in the State of any importance operating at the present time is located at Cokedale, in Cherokee County. This plant is operated in connection with a mine, and is not dependent upon the neighboring mines for its supply of coal. It is owned and operated by Eastern parties, and was built in October, 1898—Fig. 1. In connection with the washer is a series of 50 7-by-12-foot beehive ovens, built by Owen Murphey, of Mt. Pleasant, Pa. They have a capacity of 1½ to 2 tons of coke each per day.

The shaft is located to the north and west of the washer and storage bins, and is connected with the top of the former by a covered passage, supported by trestles. Upon the floor of the passage or tramway double tracks are laid. The shaft is 48 feet deep and is 7½ by 17½ feet in the clear. It is cribbed with 10 by 10-inch timbers, half lapped. There are 2 hoisting compartments, each 7 by 7 feet and an airway 2½ by 7 feet. Considerable trouble from "horse-backs" and the pinched-out and disturbed coal was experienced in developing the mine. Exploratory entries were driven for quite a distance in several directions, and connected with other shafts and workings. These provide several openings now designated as air shafts. The closest of these air shafts is 300 feet distant from the main hoisting shaft. It has 2 compartments 7 by 7 feet. The next is the main up-cast, and is also double, each compartment being 6 by 6 feet.

Owing to the comparatively slight depth of the

tles, which raise it 33 feet above the ground. From the storage tank the washer draws its supply.

The mine-run coal is hoisted in the pit cars, run by hand from the cages, thence to the washer on the

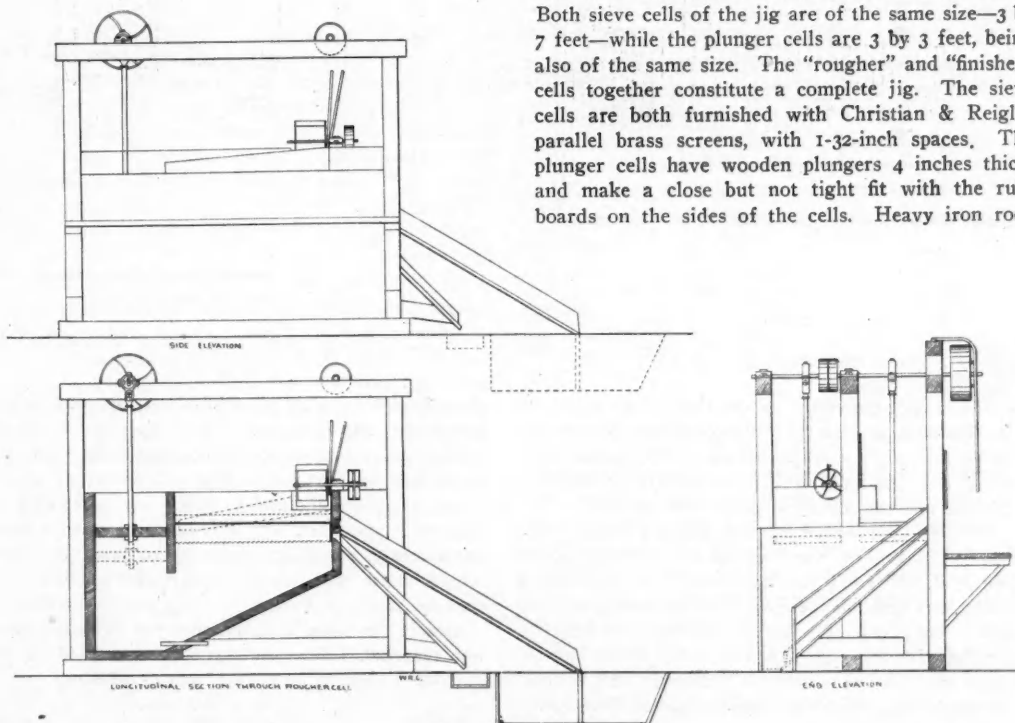


FIG. 3.—COAL JIG.

tramway—empty cars returning to the shaft on the second track. At the washer end of the tramway the cars are run onto a hand tippie, which is placed at the head of a chute leading to the crusher feed. The tippie is simply a short section of track mounted on a platform, which in turn is mounted on a journal running transversely with it, and so placed that when the loaded car is run upon that portion of the track the momentum of the car, which is checked by the hooked coils, throws the tippie out of equilib-

rium and causes it to dump. The car may be run on carefully and the tippie operated by hand. When the car is empty the tippie rights itself. From the chute the coal passes to a horizontal trough conveyor, by which it is delivered to the first crusher or set of toothed rolls, which are 3 feet long by 18 inches in diameter. The teeth are 3 inches long and diamond-shaped. The rolls are driven by belts at a speed of 160 revolutions per minute. From the first set of rolls the partially disintegrated coal passes to a second set, provided with corrugated faces, the corrugations being ¼ inch deep and ½ inch apart. This set of rolls is also driven by belts at a speed of 160 revolutions per minute. The shells of rolls in both cases are made of cast iron, chilled, and are furnished in segments to facilitate repairs and also reduce cost of breakage. On passing the second set of rolls the coal passes downward through a chute to the foot of a 34-foot bucket elevator. The buckets travel at a rate of 20 feet per minute. The fine coal is delivered by this elevator to a hopper-shaped storage bin of 20 tons capacity, from which it is fed by chute to a coal jig as desired.

*Facts gathered principally while working for the University Geological Survey of Kansas, and published by permission of the director.

conducts the coal and water passing over the bed to a parallel bar screen 4 feet long by 3 feet wide, similar in all respects to those employed in the jig cells. The object of this screen is to separate the water from the washed coal. The oversize coal passing this screen is discharged into the boot of a double-chain bucket elevator, which raises and discharges the coal into storage bins for the washed coal. A considerable quantity of fine coal carried through the screen is collected with the water in a shallow tank, and is shoveled as it collects into the bucket elevator, which raises the coarser jig product.

Discharge gates for the accumulations on the bed are provided at the ends of both rougher and finisher cells, which are operated by levers—through these gates the shale, fire clay and pyrite are discharged into a chute, which delivers to a 35-foot square-

STATISTICS OF COPPER SMELTING AND REFINING IN THE UNITED STATES.

The Census Report on copper smelting and refining in the United States in 1899 contains a great mass of valuable statistical information, but owing to the manner in which the various branches of the industry are interwoven, it is difficult to make therefrom many technical deductions that are of interest. The total production of refined copper was 602,595,113 pounds (269,016 long tons) and 27,298,926 pounds of blue vitriol (reported by the copper refiners) containing 6,824,732 pounds of copper, or 3,047 long tons, making an aggregate product of 272,063 long tons. In the production of this copper there was also turned out 13,229,911 ounces of fine silver and 224,352 ounces of fine gold. The total quantity of ore smelted was 4,039,315 long tons; of matte pur-

to blister copper or anodes. Of the 284,020 tons of the latter products that were purchased, 14,745 tons were refined in Connecticut, 75,165 in Maryland, 83,852 in Michigan, 72,867 in New Jersey and 37,391 in New York these five States accounting for the total. The distribution of the refined copper production of 602,595,113 pounds was as follows: Connecticut, 29,950,425 pounds; Illinois, 4,517,647; Maryland, 133,619,824; Michigan, 102,001,189; Montana, 95,404,468; New Jersey, 170,326,925; New York, 66,774,635. The concentration of the refining industry in the vicinity of the chief markets and districts of consumption is noteworthy.

There were in the United States 47 copper smelting and refining establishments in the census year, which represented a capital of \$53,063,395 and gave employment to 976 salaried officers, clerks, sales-

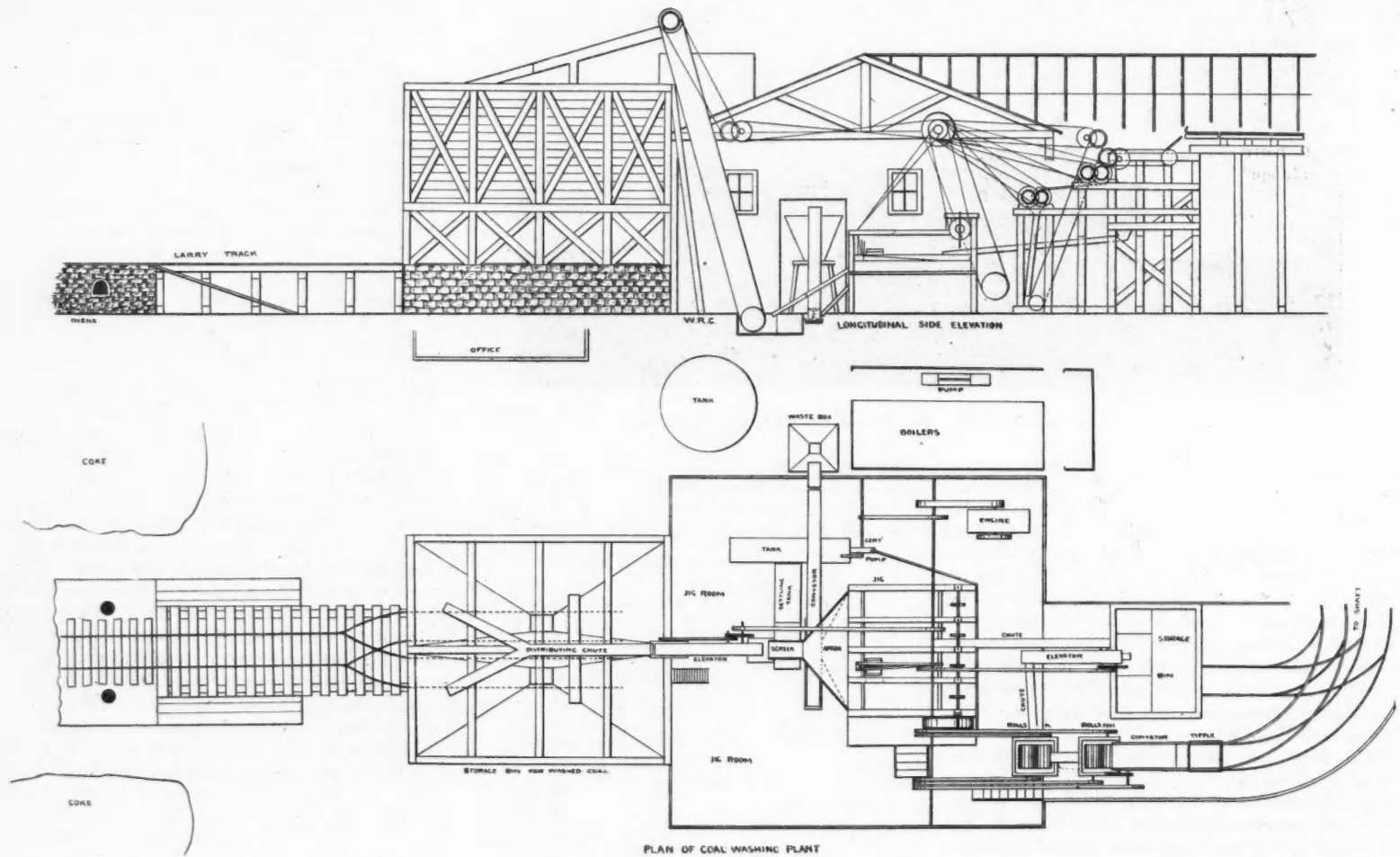


FIG. 2.—PLAN AND ELEVATION OF COAL WASHING PLANT.

linked trough conveyor. From the trough conveyor the material passes to a double-chain bucket elevator, thence to a waste pocket. The hutch product of the jig, of which there is but little, is also discharged into the conveyor to the waste pocket.

The elevator delivering the washed coal to the storage bins is 65 feet high and is inclined at an angle of 70° from the horizontal. A distributing chute leading from the elevator is so arranged as to permit the filling of either, or portions of either, of the two bins at will. It is customary to fill one bin while the coal in the other is draining. The bottoms of the storage bins are hopper-shaped. Horizontal sliding gates, operated by racks and pinions and hand wheels, furnish a convenient method of regulating the discharge.

A 6-ton lorry runs on a track under each bin. The main track, extending the full length of the ovens, is divided into two lines and prolonged under the discharge gate of the two bins.

The time taken in burning a charge of coal varies from 48 to 72 hours. In the former case the ovens will be left open longer than when a longer time is taken for the burning, but a proportionally smaller yield of coke is obtained.

chased, 48,182 tons; and of blister copper and anodes purchased, 284,020 tons. These figures of course represent to the most extent the same thing. The ore is smelted, chiefly in the Western States, to matte, blister copper and anodes, which are purchased by refiners in the East, who also buy and smelt a comparatively insignificant quantity of ore. In cases where matte and blister copper and anodes were manufactured as an intermediate product and consumed in the same establishment the quantities were not reported. The quantity of ore smelted in the various States, in long tons, was as follows:

Arizona	752,642	New Mexico	23,048
California	223,251	New York	45,000
Colorado	159,729	South Dakota	124,132
Michigan	a	Tennessee	85,723
Montana	2,442,636	Utah	65,292
Nevada	19,071	Virginia	5,025
New Jersey	3,766	Washington	90,000

a No ore is reported smelted in Michigan, and apparently the Lake Superior "mineral" which amounted to 108,250 long tons (121,243 short tons), is not included in the total.

The greater part of the matte purchased was smelted by concerns in New York and New Jersey, the former reporting 10,920 tons and the latter 29,778 tons. The comparatively small quantity of matte that is sold from one works to another is noteworthy; most of the smelters of ore now reduce it directly

men, etc., and an average of 11,324 wage-earners. Of the 47 establishments, 27 were engaged in smelting only, 15 in refining only, and five in both smelting and refining, the largest plants being comprised in the last category. The total sum paid for salaries was \$954,905; for wages, \$8,529,021; for all materials other than ore, matte and crude copper, \$14,068,522; and for miscellaneous expenses, \$1,522,325. The cost of ore, matte and crude copper was \$108,105,607, and the grand total cost of production, not including selling expenses and depreciation of plant, was \$133,180,380. The aggregate value of the products was \$165,131,670.

COAL IN NEW CALEDONIA.—A company has been organized in Paris to operate coal mines in New Caledonia. A party is being organized to make preliminary surveys in the coal region.

IRON-MAKING IN INDIA.—A Calcutta dispatch states that Mr. Tatta, of Bombay, a Parsee millionaire, has completed a scheme for working the enormous deposits of iron ore in the Central Provinces. He has the support of the Indian Government in the enterprise.

THE ECONOMIC THEORY OF SHAFTS AND SLOPES FOR FLAT COAL BEDS.

By E. BRACKETT.

After the approximate point of openings has been decided on, the method of entry is ready for study. If the coal does not lie high enough above the railroad at the point of entry to allow the coal from the mine to be properly screened before entering the transportation cars, some means must be found to raise the mine cars to the required height.

The means for doing this, whether they include an actual rock shaft or slope, or simply surface grading, trestling, etc., may be called a shaft system if the hoist is vertical, or a slope system if otherwise. Its height in either case is the distance from the bottom of the coal to the apex.

In the discussion of the economical means of so raising the loaded mine cars it has been found impracticable to cover the entire field, point out the influence of local conditions and discuss endless modifications of design. With this in view, certain local conditions are assumed, certain leading types selected, and approximate calculations made. It is believed that the brevity so gained not only renders the study clearer, but more effectually emphasizes certain points of wide application.

To obtain this brevity and scope: The coal and surface are assumed as level. Multiple deck cages are excluded on account of their comparatively rare application. Self-dumping cages are excluded, as their equations differ in no wise from ordinary cages. Their cost of installation is usually less, as they require no landing and switching of mine cars on top. "Monitors" and slope cages are omitted, as they are special contrivances to meet special conditions. Hoisting on slopes by means of the introduction of links in the rope is also omitted, as the ground is sufficiently covered by the discussion of closely related forms. Traction locomotives or motors working on slopes are omitted, as in general such an arrangement is not economical. If feasible at all by reason of peculiar local conditions, the fact is evident.

The various methods of entry, then, are:

- A. By a shaft
 - 1 Single hoist
 - 2 Double hoist.
- B. By a slope
 - 1. With a separate system of haulage for slope alone.
 - (a) By means of an engine plane either single or double.
 - (b) By means of an endless chain furnished with hooks which engage stops on the mine cars. A similar chain being used for lowering them.
 - 2. With a common system of haulage for the mine and slope.
 - (a) By means of a single or double tail rope system.
 - (b) By means of an endless rope with trips and grip car or cars.
 - (c) By means of endless rope running single cars each furnished with a grip.

Each of these systems possess limitations which can be discussed algebraically as follows: the output of a single hoist shaft is limited by the speed of hoisting and the time of changing cars.

In calculating, the friction of moving cars, ropes, etc., the weight of ropes, etc., have been omitted. To compensate for this, the coefficient of rolling friction on cars has been increased. Upon slopes the length of the haul is considered as the distance from the toe to the apex. In reality it is at least this distance increased by the length of the trip. This error may be very considerable on short, shallow slopes. It may be compensated for in such cases by assuming a rate of trip speed much lower than that at which it is expected to run.

An additional source of error will be found where

long trips are hauled up short slopes. If the trip is longer than the slope, the ordinary formulas for the pull of the trip are evidently in error. If inspection shows this to be the case, the calculation must be corrected.

It is believed that the commission of these errors when properly watched and allowed for do not destroy the usefulness of these preliminary calculations. They do much for simplicity.

Let *d* equal the depth of the shaft measured in feet from the lower landing to the upper.

Let *s* equal the mean speed of hoisting in feet per minute, which can be as high as 500 or 600 for a second-motion engine and as high as 1,500 or 2,000 for a first-motion engine.

Let *c* equal the total time in minutes lost in changing cars, say from 1/2 to 1 1/2 minutes, usually 1.

Let *t* equal the time in minutes elapsed between the delivery of two consecutive cars at the top.

Let *O* equal the output in mine cars per hour.

$$\text{Then } t = \frac{2d}{s} + c.$$

$$O = \frac{60}{\frac{2d}{s} + c} \quad (1)$$

For a double hoist this last becomes

$$O = \frac{120}{\frac{2d}{s} + c} \quad (2)$$

The output from a single haul rope depends upon the strength of the rope, the grade, and the time lost in coupling and uncoupling the rope. Before proceeding with the discussion, however, it is to be noted that when the mine cars are hauled up the slope without cages (as in this discussion) it is not practicable to use a grade so great that the coal will be spilled from the car. This maximum grade varies with conditions, but may be stated in general as between 30 and 40 degrees.

In a single haul slope (simple engine plane)

Let *n* equal the number of cars hauled per trip.

Let *g* equal the sine of the angle of the grade equal per cent grade, slant measure.

Let *s* equal the speed of haulage in feet per minute, usually between 400 and 600 feet.

Let *d* equal the depth in feet from the toe to the apex of the slope, vertical measurement.

Let *c* equal the total time in minutes occupied in coupling and uncoupling rope, etc., between the delivery of two consecutive trips at the top. This averages about 2 minutes.

Let *t* equal the time in minutes of making a round trip.

Let *O* equal the output in cars per hour.

Let *w* equal the gross weight in pounds of a loaded mine car. This varies from, say, 3,500 pounds in thin veins to 7,000 or 8,000 pounds in thick ones.

Let *h* equal the number of trips delivered per hour.

Let *p* equal the permissible pull on the rope in pounds. This quantity is limited by the size of the rope and couplings which it is convenient to handle. Ordinarily *p* should not exceed 15,000 or 20,000 pounds.

Then $n = \frac{p}{w(g + .02)}$, .02 being the coefficient of friction.

$$\text{And } t = \frac{2d}{gs} + c.$$

$$\text{Also } h = \frac{60}{t}$$

$$\text{Hence } O = hn = \frac{60p}{w\left(\frac{2d}{gs} + c\right)(g + .02)} \quad (3)$$

For a double haul slope this becomes

$$O = \frac{120p}{w\left(\frac{2d}{gs} + c\right)(g + .02)} \quad (4)$$

Considering *d*, *s*, *c* and *p* as constant in equations 3 and 4, the output can be shown to vary with the grade. The output increases as the grade decreases

until a maximum value of *O* is reached, after which *O* decreases. For a maximum value of *O*;

$$g = \sqrt{\frac{.04d}{cs}} \quad (5)$$

in either case, (3 or 4).

The output from a chain haulage slope evidently depends only on the speed of the chain, the spacing of the hooks and permissible pull. It is independent of the grade. The following (see formula No. 6) will show that *p* is nearly independent of the grade. Hence economy would indicate that the slope be as steep as mechanical considerations would allow. Engineering practice seems to put the grade at 30 per cent or less, slant measurement.

Let *d*, *w*, *O* and *g* equal the same quantities as heretofore.

Let *p* equal the permissible pull on the heavy chain in pounds.

Let *s* equal the speed of the chain in feet per minute, usually about 60 feet.

Let *i* equal the interval in feet between two consecutive hooks on the chain. This is often about 15 feet.

The mean value of *p* is

$$p = \frac{dw(d + .03)}{gi} \quad (6)$$

(.03 being coefficient of friction.)

$$\text{And } O = \frac{60s}{i} \quad (7)$$

When one system of tail rope haulage is used from the tippie, down the slope and inside of the mine, the output depends upon the size of the trip and the number of trips delivered per hour. The first of these depends upon the grade of the slope and permissible pull, and the second upon the total length of the haul.

Let *l* equal total length of haul from tippie to mine switch, inside, in feet.

Let *c* equal time lost per round trip coupling and uncoupling ropes, etc., in minutes. Usually from 2 to 4 minutes.

Let *t*, *s*, *h*, *n*, *p*, *w*, *g* and *O* have the same significance as for a single haul slope. The remarks, then, made on the usual value of some of these characters is equally applicable here.

Then if one trip only, either empty or loaded, be hauled at a time:

$$t = \frac{2l}{s} + c \quad h = \frac{60}{t} = \frac{60}{\frac{2l}{s} + c} \quad O = hn = \frac{60n}{\frac{2l}{s} + c} \quad (8)$$

If one empty and one loaded trip be hauled at the same time:

$$O = \frac{120n}{\frac{2l}{s} + c} \quad (9)$$

In either case, by neglecting the empty trip, we have:

$$n = \frac{p}{w(g + .02)} \quad (10)$$

Instead of the above-mentioned tail rope system, trips might be run in an exactly similar manner on an endless rope, each trip being supplied with one or more grip cars. In this case equations 8 and 9 are applicable, as are also the remarks regarding the values of the characters. In addition to the previous last mentioned characters,

Let *r* equal the available pull of one grip car, in pounds, probably about 3,000 to 5,000 pounds.

Let *u* equal the number of grip cars per trip.

$$\text{Then } n = \frac{ur}{w(g + .01\frac{1}{2})} \quad (11)$$

The coefficient of friction being taken as .01 1/2, instead of .02 as the friction of the cars only, and not the ropes, etc., are included.

This system is mentioned here only for completeness. Its scope as here applied is evidently inferior to the tail rope. Hence further discussion of it in this article is omitted.

Endless rope haulage is also worked by increasing the number of trips and decreasing their size and

gle slope, is seldom selected. Besides costing more it is more inconvenient to operate. Hence, except in those cases where its use is required for large outputs, it is here canceled. Chain haulage, probably on account of its friction, great size and length of chain, and the trouble and expense of keeping it in repair, we seldom find used to great depths. Hence, we consider it only to a depth of 200 feet. A common system of haulage for the slope and mine is a complex question which the table only partially shows. Its solution belongs to a discussion of costs and economy.

(To be Continued.)

THE NEW DEEP-LEVEL MINES IN THE TRANSVAAL.

The following notes are from the special commissioner of the London *Economist*, who has heretofore shown remarkable clearness of judgment in relation to gold mines in other parts of the world. His remarks are worth careful consideration.

In this criticism of the deep-level problem the reader must realize that it is the deeper mines which are mainly referred to. There is a possibility that the ore of the Rand beds gets poorer with depth. Such a limit, however, below which payable ore merges into unpayable—if this actually happens—I would place at an average of over 2,000 feet vertical; and the boundaries of many of the successful first row mines do not reach this depth. Again, supposing even there is no falling off in value, I intend to criticise a number of the deeper mines simply because of their depth. In the mines the reef lies so deep that ordinary engineering and financial problems look to be quite as serious as even a hypothetical falling off in the value of the ore. This explanation, that the deeper mines are mainly referred to, not those in the first row, may with advantage be studied by some of my critics who, wedded by conviction or by policy to the idea that all deep levels are sound ventures, are apt to confuse proved mines in the first row with speculative claim areas on the fourth or fifth rows.

The term deep level, too, is relative. I call every mine an outcrop mine in which the ore lies at less than 1,000 feet vertical. Looked at in this light, the Bonanza is not a deep level, nor are the large parts of the areas of Geldenhuis Deep and Langlaate Block B Deep. From about 1,000 feet vertical to 2,000 feet vertical, or so, is the area of reef which is embraced by the first row. Many of the outcrop mines own this area of ground themselves. The prospects of the first row mines have been pretty well ascertained. Ton for ton, the ore in these mines, that is to say, ore lying between the depths of 1,000 feet vertical, and say, 2,000 feet vertical, is nearly as good as that in the outcrop mines; the falling off in value is so small as not to be worth serious consideration. I believe that any falling off in values there may be in depth does not commence in these mines, or at least only in the deepest parts of them, and they, therefore, would only be affected to a small degree in their lowest extremities, by any gradual impoverishment in the gold contents of the ore.

But if poorer patches increase with depth, I would not expect the second row mines—owning the reef which lies, roughly, between 2,500 and 4,500 feet vertical—to escape their influence, still less the third row mines, at from 4,500 to 6,000 feet, or the fourth or fifth row, in which the reef lies at still greater depths.

If the Rand Conglomerate beds suffer a depreciation in value in depth similar to the ordinary ore skoot in other parts of the world, it is quite certain that these very deep mines will never be profitable. But we do not know, of course, that this is going to happen.

We will, then, as nearly as may be, exclude the first row deeps from the question, and go on to deal with the problems involved in working that great area of the Rand basin, which, beginning at about 2,000 feet vertical, goes down as far as even the

wildest imagination of the company promoter will allow as a workable depth.

The special questions involved in working this deep ground may be set forth as follows:

1. Questions of heat; water, and the cost of pumping from great depths; cost of hoisting.
2. Questions of meeting faults, dykes, and disturbed ore bodies; also the chances of impoverishment of the ore at a great depth.
3. The questions of taxation, labor, local conditions, etc.
4. The questions of finance; lapse of time before production can commence.

For mines in which the reef lies at a great depth, such as are now being floated off, all these questions are accentuated. Such a mine may require a shaft 7,000 feet deep; it will require over \$5,000,000 for working capital; it will be 7 or 8 years before it can produce. In addition to this, it is not certain that a vertical shaft of 7,000 or 8,000 feet comes within the scope of engineering possibilities, and the value of the ore at such a depth, and its unfaulted condition, can only be guessed at. This is the sort of problem that the deep-level mania is now leading up to.

We may now consider the definite questions just enumerated, which appertain to very deep mining.

The first questions are those of heat; of pumping water, and of hoisting the ore. The increase of heat in the Rand quartzites is shown to be only 1° for a vertical depth of over 200 feet. The increase in a vertical shaft 6,000 feet deep would probably be not more than 30 degrees. This, added to the surface temperature, would not be a prohibitive heat at which to work, but artificial cooling would have to be introduced. In a shaft 8,000 feet deep the cost of cooling the temperature would be considerable. The pumping of water from, say, 6,000 feet, would be unlikely to prove a serious item—for the simple reason that there is very little water in the rock at that depth. Most of it is collected by the shallower shafts and pumped from them before it can penetrate deeper. As to hoisting from, say, 6,000 feet vertical, all engineers are agreed that this is feasible. The chief requirements are a shaft sufficiently large and enough working capital to purchase and erect the most powerful engines. But mines are now being floated which will require shafts of more than 6,000 feet vertical, which will require them to be 7,000 or 8,000 feet. Here we face engineering problems that cannot lightly be set aside. The force required to lift a heavy skip of rock from 8,000 feet, to which must be added a good many tons for the mere weight of the rope, is so great as to hardly come within the scope of payability on an ore of the average value of that found in the Rand beds. On the whole, it may be said that neither heat, water nor horse-power required offer serious objections to sinking a shaft to 6,000 feet vertical, but a good many of the proposed shafts will have to go deeper than 6,000 feet. There are, to my mind, serious technical questions to urge against these shafts, even assuming that the ore at the bottom is richer than is likely to be the case.

COPPER SMELTING IN NORWAY.*

The ore produced at Rörös and Sulitelma, in Norway, is of similar character. The average composition of the smelting ore produced by the richest mines at Sulitelma, in 1898, was as follows: 7.26 per cent Cu, 34 S, 2.5 Zn, 22 per cent gangue, traces of nickel and antimony, and 600 grams of silver per ton of copper. Water power is available, coke is not dear, and there is a sufficient supply of refractory material. At Rörös the ore is roasted in heaps of 400 tons; at Sulitelma in heaps of 1,000 tons. Brückner cylinders are to be installed for roasting the fine ore. At Rörös the raw ore, which contains about 4.75 per cent Cu, loses 15 to 20 of its weight in roasting, and yields a product assaying 5.6 to 6.2 per cent Cu and about 4 per cent S. At Sulitelma the ore is burned down to 11-15 per cent S. The roasted ore is smelted in

American water-jacket furnaces, 1.10 meters in diameter at the tuyeres, 1.32 meters at the throat, and 2.62 meters in height from the tuyeres to the top of the jacket. There are six tuyeres of elliptical cross section, about 6 by 10 centimeters. The furnaces are of the crucible type, the slag tap being 35 centimeters above the matte tap. The matte is tapped into a forehearth, which is lined with 25 centimeters of coke-meal cemented with a clay paste. This lasts from 3 days to 12 weeks. The slag running over from the forehearth flows through two pots in succession, the foul slag collected in the first being re-smelted. The furnaces discharge their gases directly into the air, there being no dust chamber. Each works has four blast furnaces and two converter stands.

At Sulitelma the charge consists of about 67 per cent ore, 20 per cent Bessemer slag and 13 per cent blast furnace slag, besides which sufficient lime is added to make a slag that will contain about 5 per cent CaO. The ore smelted in 1898 averaged about 6.15 per cent Cu, 11.64 per cent S, and 39.04 per cent gangue. The consumption of coke is normally 13 per cent of the weight of the charge. The furnaces at Rörös are blown with a blast pressure of 35 millimeters; at Sulitelma, 28 millimeters. The slags made at Sulitelma averaged about 0.58 per cent Cu in 1898. It was expected to reduce them to 0.4 per cent Cu. The matte is tapped from the forehearth directly into converters, which are installed on a lower level of the furnace house. The converters are lined with 30 centimeters of a clay mixture containing 75 to 80 per cent of silica. A lining lasts six to eight charges. Two converters are generally in operation, two are in process of relining, and two are being warmed up. The matte charged in assays 45 per cent Cu at Rörös and 38 to 40 per cent at Sulitelma. The charge for a converter amounts to 1,000 kilograms; it is blown with air at 48 millimeters pressure, and is finished in about 1.5 hours. The converter slags assay 1 to 5 per cent Cu and the crude metal about 99 per cent Cu. At Sulitelma the latter is refined by poling immediately with fresh birch sticks, whereby a product assaying 99.8 per cent Cu can be obtained by very careful work, the average being 99.25 to 99.4 per cent Cu. At Rörös the copper is refined in reverberatory furnaces. The total loss of metal in the smelting process is 0.75 per cent Cu. The smelting cost is 250 to 275 marks (\$59.50 to \$65.45) per ton of copper, and the total cost of production is about 630 marks (\$149.94), which corresponds to 6.8 cents per pound. The production of copper at both works is about 700 tons per annum.

IRON-MAKING IN ELBA.—La Société Minière et des Hauts Fourneaux de l'Elbe has just started its first blast furnace on the island of Elba. It is now turning out about 100 tons of pig iron per day.

GERMAN IRON-MAKERS IN RUSSIA.—In view of the approaching expiration of the commercial treaties between Germany and Russia, and the increase in Russian tariff duties which will follow, several large German firms are said to be considering the question of establishing works in Russia for iron and steel manufacture.

PIG IRON PRODUCTION IN GERMANY.—The output of the German blast furnaces in July is reported by the German Iron and Steel Association at 705,921 tons, which is 10,848 tons more than in June, and 56,382 tons more than in July, 1901. For the seven months ending July 31 the total was as follows, in metric tons:

	1901.	1902.	Changes.
Foundry iron.....	880,377	913,188	I. 32,811
Forge iron.....	836,220	704,162	D. 132,058
Bessemer pig.....	276,638	228,906	D. 47,732
Thomas (basic) pig.....	2,610,083	2,873,441	I. 263,358
Totals	4,603,318	4,719,697	I. 116,379

The gain this year was 2.5 per cent; it was almost entirely in basic pig, though there was a small increase in foundry iron. Forge iron showed a large decrease, and bessemer pig also.

*Abstract of a paper by K. Glinz in *Berg-und-Hüttenmännische Zeitung*, 1902, LXI., iii. and iv.

PRODUCTION OF COAL TAR IN THE UNITED STATES.

The recovery of coal tar as a by-product in the manufacture of illuminating gas and coke in the United States has assumed very important proportions, as is shown by the statistics of the last census; most surprising is the large proportion of the total which is furnished by the by-product coke ovens, the output of which in 1899 amounted to 52,344 short tons. The recovery of tar in illuminating gas manufacture in 1900 is computed by the census statisticians as follows: The total production of gas was 67,093,553,471 cubic feet, of which upward of 75 per cent was water-gas. Reckoning the make of coal gas at 20 per cent of the total, its quantity was 13,418,710,694 cubic feet. The average yield per ton of coal being 10,000 cubic feet, there must have been consumed for this purpose 1,341,871 tons of coal. The yield of tar per ton of coal is approximately 5 per cent by weight, which would indicate a recovery of 67,094 tons of tar. The quantity of water-gas tar is computed from the quantity of oil consumed, which was 194,857,296 gallons. About 25 per cent of the oil consumed is recovered as tar, corresponding to 48,714,324 gallons, which is equivalent to 222,868 tons, a gallon of this weighing 9.15 pounds (specific gravity 1.1). The total production of coal tar and water gas tar in 1900 was therefore 342,306 tons. The quantity of coal tar reported as consumed in the United States in 1900 was 22,004,650 gallons, which at 10 pounds per gallon gives 110,023 tons. The yield of tar from the manufacture of gas in Europe in 1898, according to Lunge, was 1,120,000 tons, of which Great Britain supplied 666,650, Germany 166,650, France 135,000 and Austria-Hungary 41,500, the remainder being distributed among the various other countries.

SHIP-BUILDING IN RUSSIA.—It is reported that an extensive shipbuilding establishment is to be laid down either on the Black Sea or the Azoff, with German capital, but under Russian management. Three of the foremost banks in Berlin and the firm of Friedrich Krupp, of Essen, are said to be interested in the venture.

BRITISH MINING MACHINERY EXPORTS.—Returns of the Board of Trade show that Great Britain made the following exports of mining machinery during the 7 months ended July 31:

	1901.	1902.	Changes.
European countries.....	£27,261	£26,350	D. £20,911
South Africa	62,851	117,852	I. 55,001
East Indies	43,622	40,887	D. 2,735
Australia	77,149	58,637	D. 18,462
South America	23,620	23,241	D. 379
United States	181	215	I. 32
Other countries	48,578	52,484	I. 3,906
Totals	£303,264	£319,666	I. £16,402

There has been a marked improvement in the South African trade.

COLOMBIAN MINING DECREE.—Consul H. A. Gudger, at Panama, has made a report to the State Department on the recent mining decree that went into effect June 1, 1902, and which radically increases the expenses involved. The essential changes made may be summed up as follows: The cost of denouncing property for mineral purposes was formerly nothing; now it is \$10 (about \$4 gold). To denounce three pertencias by the old law cost \$5 (\$2); at present it costs \$500 (\$200) for each pertencia (a rectangle 600 meters long by 240 wide). The tax title formerly cost \$10 (\$4), but by this decree it is made \$150 (\$60). The annual tax on each pertencia was \$2 (84 cents); now it is \$100 (\$40) for each pertencia, whether it is being worked or not. For alluvial claims the annual tax for each square of 5 kilometers was \$1 (40 cents); now it is \$150 (\$60). With these charges the cost of the smallest claim will amount to \$250 (\$100) or upwards. A great deal of dissatisfaction is expressed with the increased charges, and many think that they will retard the development of mines.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALY REPORTED.

LIEN FOR MATERIAL ATTACHES TO MINE AS WELL AS IMPROVEMENTS.—Where, under a contract for the sale of real estate, the buyer is required to make certain improvements on the same, and the materials purchased and used for such improvements by the buyer are not paid for, a material man's lien attaches to the mine as well as to the improvements.—*Hendrie & Bolthoff Manufacturing Company v. Holy Cross Mining and Milling Company* (68 *Pacific Reporter*, 785); Court of Appeals of Colorado.

CONSTRUCTIVE ACCEPTANCE.—One contracted to pay a fixed sum for every ton of clean, merchantable coal, exclusive of culm or mine waste, taken from a certain mine, which would pass through ½-in. mesh. Acting under this contract it took culm from the mine, brought it to the surface and after passing it through breakers, carried it over to its own land, and there retained it. It was held, that the act of dominion thus exercised over the culm constituted a taking of same so as to make it liable to pay at the same price agreed to be paid for clean and merchantable coal.—*Genet v. Delaware & Hudson Canal Company* (75 *New York Supplemental Reporter*, 553); Supreme Court of New York.

RIGHT TO PAY STOCK FOR LANDS IN WEST VIRGINIA.—Under the laws of West Virginia (Code, chapter 53, section 24) a mining company, when fully organized, may purchase real and personal estate for the use of the corporation on such terms and conditions as may be agreed upon by the stockholders and directors of the company, and pay for it by issuing as many shares of its capital stock to the seller as are equal in amount at par value to the price agreed upon for such property, not to exceed its authorized capital.—*Merchants' and Mechanics' Savings Bank v. Belington Coal and Coke Company* (41 *Southeastern Reporter*, 390); Supreme Court of West Virginia.

WHEN PARTIES CAN RESCIND CONTRACT ON OIL LANDS.—An instrument executed by land-owners and others recited that the owners granted the others all oil and gas on the lands, to be paid for by a certain royalty, and that operations should be begun within two years or the instrument be void, but that forfeiture might be averted from year to year thereafter by the payment of \$100 in advance. It was held, that as the contract could not be regarded as a sale, to be defeated on condition subsequent, because the real consideration was the development of the property, for which no definite time was fixed, and it being requisite to an option that there be some time for performance, in the absence of any equities owing to any work having been begun by the others, the owners could rescind the contract.—*National Pipe Line Company v. Teel* (67 *Southwestern Reporter*, 545); Court of Civil Appeals of Texas.

OIL LEASE CANNOT BE ASSIGNED ORALLY.—The laws of Indiana provide that conveyances of land or any interest in same shall be made in writing, etc., except where made for lease less than three years. An instrument signed and acknowledged by a land-owner gave the second party all oil and gas under the premises, and provided that if no well was completed within a certain time, the second party should pay \$1 per day till completed. The second party assigned his rights, and in action by the grantor against him to recover daily rentals accruing subsequently to the assignment, he claimed that his rights had been surrendered, and also that they had been assigned to a third party on a promise of the first party to release him, and that the third party had taken possession and paid the rental. It was held that the conveyance was either a valid grant of an

incorporeal hereditament, or a lease of land, and incapable of oral surrender by act of the parties, owing to the law of Indiana, and the common law rule that an incorporeal hereditament could only be surrendered by deed; and the facts of the assignment showed no surrender by operation of law.—*Heller v. Dailey* (63 *Northeastern Reporter*, 490); Supreme Court of Indiana.

ABSTRACTS OF OFFICIAL REPORTS.

Mount Morgan Gold Mining Company, Queensland.

The report of this company covers the year ending May 31, 1902. The total receipts from gold during the year were £570,337; miscellaneous, £4,236; total, £574,573. Working expenses were £296,561; royalty and taxes, £17,129; total, £313,690, leaving a profit of £260,883. To this is to be added £22,279 brought forward from previous year, making a total of £283,162. Dividends paid were £204,167, leaving a balance of £78,995 forward to the current year.

The ore mined was 213,907 tons, of which 120,641 tons were oxidized ore and 93,266 tons sulphide ore. The total development work done during the year was 2,418 feet, of which 786 feet were on the main tunnel. In addition to the ore mined 97,697 tons of waste rock were removed.

The ore worked, including 19,046 tons of tailings, etc., was 232,953 tons, as follows, with the gold recovered:

	Ore, tons.	Gold oz.	Oz. per ton.
Mundic Works.....	93,169	66,758	0.71
West Works.....	117,021	61,974	0.53
Top Works.....	4,194	8,403	2.00
Lower Works.....	18,569	10,493	0.57
Total	232,953	147,628	0.63

There was used in treatment 291 tons of chlorine. The materials used in making this were 1,056 tons manganese, 1,008 tons salt and 3,580 tons sulphuric acid. In the company's sulphuric acid works 828 tons of Japanese sulphur and 350 tons of pyrites from the mine were used; also 82 tons of niter.

The total rainfall for the year was only 19.45 inches. This compares with 21.77 inches in the previous year, 26.60 inches in 1899-1900, and an average of 39.68 inches for the 8 years prior to 1899. Notwithstanding all difficulties, the cost of treating oxidized ore was only \$2.68 per ton, and mundic or sulphide ore \$4.07 per ton.

The plant for saving copper was run only during a small part of the year, owing to the scarcity of water.

The report of the metallurgical engineer, G. A. Richard, says:

"The upper works have been closed down, and it will not be advisable to re-start them on account of the greater cost of operating them as compared to the newer works, and as they have been altered and improved so much at different times that now the only improvement possible would be an entire rearrangement and replacement which would be as costly as an entirely new works. The successful results of the newer works render this course unnecessary, but they may be modified somewhat for a temporary purpose to be referred to later. Only the chlorination plant of the lower works is in operation for temporary purposes, in other respects the same remarks apply to this works as to the one just mentioned. Only the usual repairs have been made to the west works, and only minor alterations, due to recent exigencies, have been effected. During the ensuing year it is proposed to make some minor improvements in this plant, such as the installation of transport apparatus for emptying and filling the leaching vats and possibly some modifications for the purpose of effecting a saving in fuel. The output from the mundic works averaged considerably over the estimate when the plant was being constructed, as referred to in previous reports. The average for the last two months was over 10,000 tons per month, and under ordinary conditions this rate can be kept up and possibly increased by means of various detailed

improvements now under consideration. The alterations referred to will consist mainly of further improvements to the roasting furnaces, the addition of cooling apparatus to cope with the larger output from the latter and installation of transport apparatus in the chlorination portion of the works, besides various minor alterations to other portions.

"The extension of the open cut mining in the ensuing year will render necessary the removal of the lowest grade ore which has hitherto been left on account of its extremely low gold contents. Various schemes have been under consideration to convert this to profit, and trials are now being arranged for to determine the best. So far, it is probable that the results will be successful. On account of the extreme low grade it is necessary that a works for the purpose should cost comparatively little to construct and be of a somewhat temporary character compared to the West and Mundic works. The process and the crushing machine which are to be under trial for this purpose meet these requirements, and the utilization of the power plant and buildings of the old Upper Works do likewise. The amount of profit that can be expected is very small compared with that from the other ores.

"The increase in the output expected during the year will render some addition to the sulphuric acid works necessary in order to produce more acid. And it will also be necessary to make some alterations in order to utilize pyrites from the mine in place of sulphur.

"About 80 per cent of the water being used now is brought by train from Stanwell, a distance of 18 miles, the remainder being obtained from wells in the bed of No. 6 dam. The former cannot be relied on in case the drought does not break up in a few months; but in this event water can be obtained from other sources by the same means."

American Smelting and Refining Company.

The brief report of this company, just issued, covers the year ending April 30, 1902. The balance sheet of that date compares with that of the previous year as below:

	1901.	1902.	Changes.
Capital stock.....	\$100,000,000	\$100,000,000	.....
Bonded debt.....	1,053,000	995,000	D. \$58,000
Net cash liabilities...	4,250,443	4,755,565	I. 496,122
Profit and loss.....	2,890,349	2,951,968	I. 61,619
Total liabilities.....	\$108,202,792	\$108,702,533	I. \$499,741
Property account....	\$84,228,234	\$85,869,037	I. \$1,640,803
Metals in stocks.....	21,715,390	20,883,605	D. 831,785
Material, fuel and flux	1,267,505	957,878	D. 309,627
Cash.....	991,663	992,013	I. 350
Total assets.....	\$108,202,792	\$108,702,533	I. \$499,741

The net cash liabilities above shown were reduced to \$2,337,000 on September 2. The profit and loss account for the year shows:

	1901.	1902.	Changes.
Earnings.....	\$5,988,049	\$7,038,682	I. \$1,050,633
Betterments.....	\$888,410	\$791,306	D. \$97,104
Interest, taxes and general expenses.....	1,271,198	1,385,757	I. 114,559
Total.....	\$2,159,608	\$2,177,063	I. \$17,455
Net earnings.....	\$3,828,441	\$4,861,619	I. \$1,033,178
Dividends.....	\$1,918,000	\$3,500,000	I. \$1,582,000
Transferred as below...	1,000,000	300,000	I. 300,000
Total.....	\$2,918,000	\$4,800,000	I. \$1,882,000
Surplus.....	\$910,441	\$61,619	D. \$848,822
Surplus from previous year.....	1,979,908	2,890,349	I. 910,441
Total surplus.....	\$2,890,349	\$2,951,968	I. \$61,619

By vote of the Executive Committee on September 6, 1901, the sum of \$1,000,000 was transferred from the surplus at the close of the fiscal year ending April 30 to property account. By a similar vote on September 5, 1902, the sum of \$1,300,000 was transferred from the surplus to metal stock account and to property account; that sum representing in part expenditures for improvements to property not chargeable to operating accounts, and in part decline in market value of metals in stocks.

The earnings for the fiscal year by quarters were as follows: First quarter, \$1,510,710; second, \$1,728,392; third, \$1,795,223; fourth, \$2,004,357; total, \$7,038,682.

During the year the company made many improve-

ments, and wherever possible installed labor-saving appliances so as to carry on operation at the various works more economically. The company also completed the Murray plant, in Utah; rebuilt, after the fire, the El Paso Smelter; built an entirely new copper refining plant at Perth Amboy, which has a capacity of 120 tons per day, and has nearly doubled the capacity of the Omaha and National lead refineries, and the Aguas Calientes plant, in Mexico.

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.

The Wealth and Progress of New South Wales, 1900-1901. By T. A. Coghlan, Government Statistician. Sydney, N. S. W.; Government Printer. Pages 1,044; with map.

Ore Deposits of North Dundas. By George A. Waller, Assistant Government Geologist. Hobart, Tasmania; Government Printer. Pages, 68; with map.

Year-book and Directory of the Chamber of Commerce of Pittsburg, 1902. Compiled by George H. Anderson, Secretary. Pittsburg, Pa.; published by the Chamber of Commerce. Pages, 160.

Electricity. By George L. Fowler. Philadelphia; the Penn Publishing Company. Pages, 206; illustrated. Price, 50 cents.

New South Wales Statistical Register, 1901. Part IV. Shipping and Part V. Commerce. By T. A. Coghlan, Government Statistician. Sydney, N. S. W.; Government Printer. Pages, 68 and 278.

Jahrbuch der Chemie, 1901. Eleventh Year. Edited by Dr. Richard Meyer. Brunswick, Germany; Friedrich Vieweg & Sohn. Pages, 548.

Uebungsbeispiele fur die Elektrolytische Darstellung Chemische Präparate. By Dr. Karl Elbs. Halle, Germany; Wilhelm Knapp. Pages, 100; illustrated. Price (in New York), \$1.40.

Ontario. Report of the Bureau of Mines, 1902. Thomas W. Gibson, Director of Bureau. Toronto, Ont.; Public Printer. Pages, 308; with maps and illustrations.

United States Navy Department. Annual Report of the Hydrographer to the Bureau of Equipment. Year 1901. Capt. C. C. Todd, U. S. N., Hydrographer. Washington; Government Printing Office. Pamphlet, 32 pages.

Movement of Prices, 1840-1901. Compiled by the Bureau of Statistics of the Treasury Department. O. P. Austin, Chief of Bureau. Washington; Government Printing Office. Pages, 64.

Natal. Report on the Mining Industry for the Year 1901. By C. J. Gray, Commissioner of Mines. Pietermaritzburg, Natal; Government Printer. Pages, 102; illustrated.

BOOKS REVIEWED.

Silver Plume Mines and Scenery. Prepared and issued by the Board of Mines and Trade of Silver Plume, Clear Creek County, Colorado. Pages, 32; illustrated.

This description of Silver Plume and its neighborhood is well prepared and very handsomely illustrated. It is a credit to the local Board of Trade, and makes an attractive presentation of the claims of the town and the importance of the adjacent mines.

The Mineral Industry: Its Statistics, Technology and Trade for 1901. Volume X. 1902. New York; The ENGINEERING AND MINING JOURNAL. Incorporated. Pages, 900; illustrated. Price, \$5.

The forthcoming of Volume X. of *The Mineral Industry* reminds one that this annual publication has created for itself and most successfully occupied for a decade a field of endeavor unique among publications, annual or otherwise. Founded by the late

R. P. Rothwell as the crowning effort of a life, expended freely in the service of his profession, the latter volumes of *The Mineral Industry* have been edited by Dr. Joseph Struthers, at first as assistant editor, and with Volume X, as editor. He has succeeded in maintaining the high standard of the series.

The fact that the art of blending text and statistics so that the interest may be sustained while correct statistical information is being absorbed, and the inclusion therewith of tables and authoritative reviews of the various divisions of such an immense field of endeavor as the world's mineral industry is not an easy or tempting occupation, meets with mute but eloquent confirmation, in that despite the decade of its publication *The Mineral Industry* has still no rival for its unique niche among the scientific publications of the world. The necessity for a correct report, both statistical and by technical review of the annual progress of the United States and its comparative standing among the nations is susceptible of instant justification by the enormous total value of the domestic products of or directly from minerals.

One is given to understand in the introduction of Volume X., that the publication acknowledges its indebtedness to the United States Geological Survey for its courtesy in contributing a large part of the United States statistics for 1901.

Among the preliminary biographical notices of contributors to *The Mineral Industry*, some of whose portraits are given, names of well-known authorities on technical industry and kindred subjects will be noted, as well as some perhaps not so well known outside of their individual fields of work, but nevertheless worthy of recognition. It appears to be the object of the editor to secure contributions of practical rather than theoretical value, although the theoretical side is not neglected, and among the articles are many by men actively engaged in scientific and industrial occupations who have found time to contribute the results of their experience to an annual publication of such well known value. The introductory section summarizes, both in text and tables, the statistics relating to the production of ores, minerals, metals and secondary products of the United States during 1901, to give the busy engineer or chemist in a nutshell the facts scattered through the individual subjects of the volume. Statistics for 1900 also are given in the tables, so that the progress in the numerous individual industries may be ascertained at a glance.

Reviewing the subjects in the alphabetical order wisely adhered to in the volume, the first, aluminum and alum, including the kindred subjects, bauxite, corundum and emery, embraces the individual production of each in the United States and foreign countries; the progress in mining and manufacture of the raw products; a review of the Progress in the Corundum and Emery Industry during 1901, by Joseph Hyde Pratt; and the usual able review of Progress in the Aluminum Industry in 1901, by John B. C. Kershaw, of London, in which may be found discussions of the electrical conductivity of aluminum and its alloys, and Prof. Willson's valuable table of tests of aluminum and its several alloys.

The subjects of ammonia and ammonium sulphate, and antimony review the production, imports and consumption in the United States, as well as the world's production of antimony, with a chart graphically showing the progress in output in the chief countries of the world for the past 25 years, and include a brief summary of the chemistry and technology of the subject. Under arsenic, the production, imports and consumption of the United States and the world are detailed, and some valuable notes on the electrical furnace treatment of arsenical pyrites, and on the chemistry and technology of arsenic and its manufactured product, Paris green, are included. The production and imports of asbestos in the United States and the world's progress are briefly summarized, while under asphaltum and its various forms of rock, bituminous sandstone and ozokerite, the tables of production and imports of

the United States and production of foreign countries and Trinidad are given at length; while the History of the Asphalt Industry of 1901, inclusive, is interestingly narrated by A. W. Dow. The production, imports and consumption in the United States and elsewhere of barytes, bismuth and borax and their various manufactured products is supplemented by critical reviews of the analytical chemistry of bismuth and borax, written by Edmund H. Miller. The production, uses, consumption and industrial progress of bromine, calcium carbide and acetylene and carborundum are given as usual, while the subject of cement is detailed statistically, besides containing two reviews of unusual value, one on the Cement Industry in the United States during 1901, by Fred. H. Lewis, with especial reference to portland cement; in the other the Slag Cement Industry in the United States during 1901 is treated with particularity in an illustrated article by Edwin C. Eckel, which embraces a table of analyses of slag cements and compares the product with the portland variety in its manufacture, uses and method of application.

Chromium and chrome ore, beside details of production, imports and consumption in the United States, gives details of the foreign works producing ferrochrome, the technology and new uses for chromium and its ore, and a review of the chemistry of the subject by Edmund H. Miller. Clay, embracing brick and clay wares, with the value and individual production by States in this country and abroad, is supplemented by a very valuable technical review of Fire Clays and their Manufacture into Refractory Materials by Heinrich Ries, which, besides its statistical and technological value, ably summarizes the history of pottery, and gives a critique of the literature of the subject, with a complete bibliography during 1901. The customary tables of coal and coke production and consumption in the United States, with foreign, including the world's charted output for the past 25 years, bring the subject up to date; and the contribution on the Manufacture of Coke in the United States, carefully illustrated, is a most authoritative and careful statement of present conditions and future possibilities of by-product coke, by the eminent authority Dr. F. Schniewind. William Kent further relates the Progress in Power Plants Using Gas Producers and Gas Engines.

The section devoted to copper reflects in its size and detail the importance of that metal in the arts. The production of copper in the United States in 1901, which was nearly as large as that of the previous year, is detailed by States both in tables and text, while the usual valuable comparisons of costs of mining in Michigan may be obtained from the statistical tables under that caption. W. M. Brewer reviews the production of copper in Canada, with particular reference to British Columbia, while W. R. Mathewson performs that service for Chile. The production of Mexico, which is increasing at an amazing rate annually, is given in considerable detail. Under the caption Progress in the Metallurgy of Copper during 1901 may be found two sub-heads written by the well-known mining engineer, Paul Johnson, of British Columbia, which describe his automatic sampler and the smelting practice at Greenwood, B. C. A table of Heats of Formation valuable to metallurgists, with a brief summary of the technical bibliography of the subject, brings the subject of metallurgy up to date, and the subject of copper is further supplemented by a comprehensive review of the Progress in the Electrolytic Refining of Copper by Titus Ulke, and the Treatment of Slimes from the Electrolytic Refining of Copper by Robert L. Whitehead, while Ottokar Hofmann, in his familiar and most excellent style, reviews the Progress in 1900 and 1901 in the Making of Blue Vitriol by Hofmann's Method, which includes a wealth of detail and is carefully illustrated throughout. The subject of copperas is briefly summarized as to its production, consumption, uses and prices.

The monograph by John B. C. Kershaw on Progress in Electro-Chemistry and Electro-Metallurgy in 1901 is one of the most important contributions ever made to technical literature; the numerous im-

portant applications of electricity to chemical and metallurgical processes already in use, as well as those as yet in course of experiment, make this subject of the most vital interest to the engineer, metallurgist or chemist, for the impossible with fire or leaching processes has many times proven the practicable by electrical methods.

The production and industrial condition of feldspar, fluorspar, fullers' earth and garnet are treated with the customary attention to vital details, and the section devoted to fluorspar is enriched by an article on commercial Hydrofluoric Acid by Karl F. Stahl, which gives methods of analysis for practical work that have as yet not found their way into the text books on chemistry.

In Montana Sapphires, by Walter Harvey Weed, the author gives the history of the deposits and complete scientific data of their occurrence. In addition, the section devoted to gems carefully and thoroughly covers the subject, as in former volumes of this publication. The subject of glass contains the news of the year and notes on improvements in technology and manufacture.

The large section devoted to gold and silver contains detailed tables and text of the United States production, that of the world, and the graphical chart showing the progress in gold production for 20 preceding years. The articles by W. M. Brewer, on Alaska; on Chile, and Colombia, by W. E. Mathewson and P. N. Ospina, respectively; Progress in Gold Milling during 1901, by R. H. Richards (illustrated); a Review of Progress in the Cyanide Process during 1901, by J. S. C. Wells; Zinc vs. Electrolytic Precipitation, by Philip Argall; and Review of Analytical Chemistry of Gold and Silver during 1901, by Edmund H. Miller, introduce a wide vista of information authoritatively stated, as might be expected from the eminence of the authors. These articles, while technically above reproach, are all of them readable by the ordinary business man in search of definite information.

The sections devoted to graphite and gypsum are supplemented by a contribution on Artificial Graphite and the important Gypsum Cement Plaster Industry in Kansas, is reviewed by E. Haworth.

Iron and steel statistics and report of progress during 1901 have evidently received the careful attention deserved by their relative importance in the world's industrial development, for with the vital statistics grouped in compact form, much explanatory text conveys information not otherwise recorded. The article on Modern Improvements in the Manufacture of Pig Iron, by John Birkinbine, closes a section very instructive to those at all interested in statistical or technical data.

The two monographs on Progress in the Manufacture of White Lead during 1901, by Parker C. McIlhiney, and on Recent Improvements in Lead Smelting (illustrated), by H. O. Hofman, contain information of much value to the manufacturer and smelter. Mr. Hofman needs no introduction to technical readers, among whom his title to authoritative criticism of lead smelting is unquestionable.

The sections devoted to magnesite, manganese, mica, molybdenum and monazite bear evidence of careful treatment by the editor, while two monographs on the Nicopol Manganese Deposits in Southern Russia, by Frank Drake, and on the Mica Industry of New Hampshire, by A. J. Hoskins, illuminate little known fields of industry.

The subject of natural gas is unusually well covered, both statistically and as to text, by two well-known authorities in this and kindred subjects, F. H. Oliphant and W. H. Hammon.

In addition to the valuable tables and text on the Production of Nickel and Cobalt during 1901, Mr. F. Danvers Power demonstrates the origin, present condition and future of the important New Caledonian nickel ore deposits, while Titus Ulke, in the Progress in the Metallurgy of Nickel during 1901 (illustrated), presents a very complete dissertation and critique of the present conditions and future possibilities of this prosperous industry. Manufacturers and chemists

will find much of interest in the section devoted to Ocher and Iron Oxide Pigments.

The very complete report on Petroleum, its production and consumption, and its comparison with coal as to cost and efficiency as fuel, is very interestingly presented by F. H. Oliphant. A perusal of the article by Mr. Paul Dvorkovitz, on the Production of Petroleum in Foreign Countries, permits a congratulatory feeling on the part of Americans, in that despite the great natural resources of Russia and Siberia, our petroleum products displace theirs in Europe and Asia, their natural outlets.

The phosphate rock industry, which is annually becoming of greater importance in the United States, is suitably reviewed, both as to text and statistics, and is further enriched by a review on Progress in the Phosphate Mining Industry during 1901 by C. G. Memminger, and a monograph on the Phosphate Deposits of Ocean and Pleasant Islands, by F. Danvers Power.

Under the title Note on Platinum and Its Associated Metals, by J. F. Kemp, the author gives information of considerable value to those interested in mining and its several allied professions. The remainder of the section on Platinum and Iridium is of much interest to the metallurgist and mining engineer, more especially for the hope extended of the possible discovery of platinum ores "in place" in quantity within the limits of our own country.

The complete statistical reports from the Stassfurt deposits of potassium salts are of interest always, while the very interesting monograph by John C. B. Kershaw, of London, on Progress in the Chlorate and Hypochlorite Industries in 1901, is convincing evidence of their prosperity. The Manufacture of Potassium Cyanide is critically reviewed by Samuel Auchmuty Tucker.

The description and drawings of the Cermak-Spirek shaft furnace for quicksilver ores contributed by Vincente Spirek to the section devoted to quicksilver will be interesting to producers and consumers alike in view of the somewhat discouraging report of B. M. Newcomb on the future of the California deposits.

Victor Lenher contributes a very entertaining and instructive review on the production and recovery of rare elements both gaseous and solid; those elements which find an outlet in the shape of incandescent gas mantles receiving attention, as well as the uses new and old for silicon, titanium, and uranium.

The articles on salt, silica and slate contain all the statistical data and news during 1901, in their respective fields of industry, and the section restricted to soda and sodium contains, besides statistical data and carefully prepared text, an account of an Improved Ammonium Chloride Distiller for a 100-ton Soda Ash Plant, by John R. Watson. The subject stone contains much data of value.

Besides the valuable tables and data on sulphur and pyrites variously reported, the summary of progress in the sulphuric acid industry during 1901, by F. J. Falding presents very concretely the facts of general interest with Mr. Falding's own tables for calculation of acid, while under the title Sulphuric Acid and its Manufacture by the Contact Process, by R. Kneitsch, is a monograph (translated from the German) which cannot be recommended too highly to professional men generally as the most valuable contribution of recent years to the literature of relating to sulphuric acid. The possession of this monograph in English carefully edited and with its wealth of detail and tables is alone worth the price of the volume.

The sections on Talc and Soapstone, Tin and Tungsten bring the reviews and statistical data of those subjects thoroughly up to date.

The ground of the subjects of Zinc and Cadmium is well and completely covered by individual reports on the various important districts. Walter Renton Ingalls reviews in his usual comprehensive style the Progress in the Metallurgy of Zinc in 1901, with particular reference to economic conditions, while Mining and Milling in the Joplin District is contributed by Frank Nicholson.

The monograph on Pyritic Smelting by Franklin R. Carpenter is a valuable and pertinent contribution to a subject much in discussion; and the progress of Metallography in 1901, ably reviewed by Albert Sauveur, is an interesting addition to the literature of a science progressing fast in the appreciation of practical as well as scientific men.

In the monograph on Mine Timbering and Support of Earthworks, Mr. Wilbur E. Sanders demonstrates his absolute grasp of his subject, and with the many lessons taught by the loss of life through defective workmanship the subject cannot fail to be of interest to mining and civil engineers.

Mr. John A. Mathews in Alloys as Solutions very skillfully and interestingly marshals a mass of facts which, with the graphical charts of freezing point curves, directs the attention of the scientist to a profitable field for research. The recognition that solutions may be solid as well as liquid is of such comparatively recent scientific acceptance, that few text books which contain mention of the subject are available to the technical student.

The review of the literature on Ore Dressing in 1901, presented by Prof. Robert H. Richards is a very comprehensive critique of the progress during that year. All of the subjects considered are of vital interest to the mine owner and engineer.

Liquified Carbonic Acid Gas receives critical and informative reviewing by Auguste J. Rossi and J. C. Minor, Jr., while the monograph by H. A. J. Wilkens on Recent Progress in the Wetherill System of Magnetic Concentration offers a lucid and convincing description of a process of proven worth for the treatment of ores commonly classed as non-magnetic.

At the close of the volume the general summary of the import duties of the principal countries in the world; the tabular reports of the Mining Stock Exchanges in 1901 and an extensive list of dividends and assessments during 1901, and the Mineral Statistics of mineral and metal production, imports and exports of foreign countries present concretely a mass of statistical data that the statistician or writer would search for in vain in any other one or indeed several publications, for both foreign and domestic statistics are carefully reported from revised governmental publication.

The extent of this section may be appreciated from the fact that 80 pages are filled with figures condensed as far as modern typography will admit. A noteworthy feature of the statistics is the general use of the metric ton in the tables of the production of various minerals and products; by this means the outputs of the various countries of the world are readily comparable. Furthermore the use of the unit value per metric ton is a step of the utmost importance toward a better appreciation of the value of statistical matter. Statistics ever find their greatest usage, and hence their mead of appreciation in exact proportion as they are comparable to other statistics. The metric ton is the statistical Volapuk of the world.

H. O.

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.

Cost of Mining Ores in Different Districts.

Sir: On page 696 of the ENGINEERING AND MINING JOURNAL, dated May 17, 1902, there is a contribution on the "Expense of Mining and Milling Gold Ores in the San Juan District, Colorado," from your correspondent in that district. In it he remarks on the interesting nature of such information where it can be obtained.

It has often struck me that the questions, especially of stoping and of ore extraction work generally, would form a good subject matter for a book, which could at least be made very interesting. But in order that one could form a proper comparison with

cases known to himself, it would, I think, be necessary to give all the conditions affecting each case, such as hardness of quartz and of enclosing rock, size of vein, cost of explosives, total and per ton, etc.; and where possible footage bored per shift by both hand and machine work, etc.

Your correspondent does not give one any idea of the enclosing rock in this San Juan case, and a reference to Kemp's *Ore Deposits* does not help one much.

Quite lately, however, the above suggestion has already occurred to yourselves; but I thought it worth bringing forward.

T. B.

Yalgoo, W. A., June 30, 1902.

The Olalla Copper Company.

Sir: As some of my friends, knowing I was in Vernon reporting on mines for various companies, are under the impression that I am the writer of the report on the Olalla property brought into controversy with your correspondent, Mr. W. M. Brewer, I will thank you if you will kindly state to the contrary.

I enclose a cutting from the New York *Commercial* bearing on this subject; it seems a Mr. Brewer is also president of the company, quite a coincidence. It would be interesting to know whether Mr. W. M. Brewer condemns the property or only the over-capitalization.

HENRY WATSON.

Niagara Falls, N. Y., Sept. 11, 1902.

The Reactor Process for Treating Copper Matte.

SIR:—The Reactor process for treating copper matte, a notice of which was printed in your issue of September 13, recalls interesting experiment and practice at the Elizabeth Mine in Strafford, Vermont, while we supposed that the process was our invention and known to us only. It is our belief that it offers the best available means for making blister copper from mattes of any assay whatever.

We found that the blast flung sprays of metal and slag upward and against the arch of the blister furnace, rapidly cutting it away, by chemical action chiefly; for which our remedy was magnesia bricks. In a new furnace we would build chrome ore blocks into the arch, against which might impinge anything thrown upward from the charge. The sides and bridge-wall of the furnace are already lined with the ore, as mentioned in a paper by me published in the *Proceedings* of the American Institute of Mining Engineers.

We found that there was nothing new or patentable in the use of steam or air or silica, any or all of them, applied in the treatment of copper matte in the manner mentioned by you, and probably you are in error in supposing that a patent issued "about a year ago."

WILLIAM GLENN.

Baltimore, Sept. 15, 1902.

Amethyst Tints in Glass.

SIR: In your issue of August 30 there is an article by Mr. Canby on the amethyst tint produced in glass by exposure. I have often observed the same thing, more especially in hot places, such as the Mojave Desert, California; it may also be seen any day in our cities in the glass in sidewalks used for lighting basements, particularly where exposed to the sun. I think the following is the explanation: Manganese dioxide is used in common glass for bottles, etc., to remove the green tint produced by iron, the latter being oxidized at the expense of the former in accordance with the equation $MnO_2 + 2FeO = MnO + Fe_2O_3$; neither of the latter compounds giving color to glass when in small quantities. Now, as is well known, a very small amount of manganese dioxide imparts an amethyst tint to glass, and probably, under the influence of heat and exposure, some of the manganese monoxide present in the glass is oxidized to the dioxide, thus giving a tint varying in intensity with the time of exposure and the heat of the sun. I have observed that, other conditions being equal, the longer glass, such as a whiskey

flask, has been exposed on the ground to the sun, the deeper the color. I mention whiskey-bottles as an instance, owing to the fact that at most mining camps, where I spend much of my time, they are more in evidence than other kinds. I have never seen a change in color in common green or brown glass, probably for the reason that manganese dioxide has not been used as a decolorizer. I hope the above may be of interest.

GORDON SURR.

SAN FRANCISCO, Sept. 4, 1902.

Assays for Gold and Silver in Copper-Bearing Material.

SIR: Looking back over some twenty-five years in which I have been an assayer, it seems to me that the most important change which has taken place was the universal agreement to have copper determined by the electrolytic method. Not only has the Cornish fire assay been abandoned, but all other methods of wet assay have alike practically departed in settlement between buyer and seller, at least in the East, including the iodide method, the cyanide method, and, of course, the color test. Some or all of these are still employed for checking furnace work, or between mines and smelters both belonging to the same owners, but the electrolytic assay for copper is recognized as the standard for buying and selling. In nearly all contracts it is specified that the copper assay shall be by the electrolytic method.

It seems to me that it is now necessary that the producers and refiners of copper-bearing material carrying gold and silver should come to a similar understanding, and specify the method of assay for gold and silver. Where the method is not specified some laboratories adopt the "all fire method" by crucible or scorification assay, while other laboratories adopt what is known as the "combination method," which, however carried out in detail, has for its object the getting rid of copper before the assay is completed by scorification and cupellation. There is nearly always a difference in results between these two methods. On some material the all fire method gives higher results; on others the combination method. It is my practice to urge upon the parties to the contract, whenever I know in advance that negotiations are pending, that they shall agree upon the method of assay, and so instruct the laboratories. This removes responsibility from the chemist and avoids disagreements and explanations.

I therefore venture to suggest through the JOURNAL that in all contracts hereafter it should be made a rule to specify the method of assay to be employed for the gold and silver also. I refrain from suggesting whether this method should be the "all fire" or "combination," and, indeed, it makes little difference provided both parties understand it in advance.

A. R. LEDOUX.

New York, Sept. 10, 1902.

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.)

Price of Graphite.—Will you inform me what is the value of graphite per ton?—J. J. D.

Answer.—The price of graphite varies widely according to its quality. Thus American graphite is quoted in New York at from \$8 per ton lump to \$30 for best pulverized; Germany from \$25 to \$40; Ceylon, from \$55 up to \$160 for best pulverized. You will find quotations each week in THE ENGINEERING AND MINING JOURNAL.

Garnet.—Will you please inform me through your JOURNAL who are the principal users of garnet in the United States?—F. G. K.

Answer.—Garnet is used in the United States chiefly as an abrasive, in making sandpaper for pol-

ishing and finishing wood work; also for what is known as shoe paper, for similar purposes. Messrs. Herman Behr & Co., of New York, are large buyers of the material.

Bauxite.—Who are the chief consumers and buyers of bauxite in the United States? Do the manufacturers of refractory bricks use bauxite as they do in Europe, especially in Germany? What is meant by "spotted" bauxite?—B. A.

Answer.—Bauxite is used in the United States chiefly in making aluminum and in the manufacture of alum. The Pittsburg Reduction Company, of Pittsburg and Niagara Falls, is a large user of the material. It is also consumed by some of the large chemical companies, such as the General Chemical Company and the Nichols Chemical Company, of New York, and the Pennsylvania Salt Manufacturing Company, of Natrona, Pa.

Bauxite is not used to any extent by the manufacturers of refractory bricks in this country.

We are not familiar with the term "spotted" bauxite. It may be a local term used to denote a mineral more or less stained by iron oxide; but we know of no exact definition of it.

MINES AND METALLURGY BUILDING AT ST. LOUIS.

Bids were opened Tuesday, September 16, for the construction of the Palace of Mines and Metallurgy for the World's Fair at St. Louis. This will stand near the Liberal Arts and Government buildings in the southern part of the main group of exhibition palaces. Its dimensions are to be 525 by 750 feet, covering over 9 acres. The estimated cost is \$500,000. The contractor will be required to have it completed August 31, 1903. The design was prepared by Theodore C. Link.

THE CARMICHAEL PROCESS OF LEAD SMELTING.

This process, which is attracting some attention, is described in United States patent No. 705,904, issued July 29, 1902. It is the invention of A. D. Carmichael, of Broken Hill, New South Wales, and appears to resemble in some features the Huntington & Heberlein process, which is now in successful operation in Europe. Sulphide ore is mixed with 10 to 35 per cent of calcium sulphate, the percentage varying according to the grade of the ore. The mixture is charged into the converter and gradually heated externally until the lower portion of the charge, say one-third to one-fourth, is raised to a dull red heat; or the reactions may be started by throwing into the empty converter a shovelful of glowing coal and turning on a blast of air sufficient to keep the coal burning and then feeding the charge on top of the coal. This heating effects a reaction whereby the lead sulphide of the ore is oxidized to sulphate and the calcium sulphate is reduced to sulphide. The heated mixture being continuously subjected to the blast of air, the calcium sulphide is reoxidized to sulphate and is thus regenerated for further use. This reaction is exothermic, and sufficient heat is developed to complete the desulphurization of the charge of ore by the concurrent reactions between the lead sulphate (produced by the calcium sulphate) and portions of undecomposed ore, sulphurous anhydride being thus evolved. The various reactions, which are rather complicated in their nature, continue until the temperature of the charge reaches a maximum, by which time the charge has shrunk considerably in volume and has a tendency to become pasty. This becomes more marked as the production of lead oxide increases; and as the desired point of desulphurization is attained the mixture fuses, at which stage the calcium sulphide which is produced from the sulphate cannot readily oxidize, owing to the difficulty of coming into actual contact with the air in the pasty mass, but, being subjected to the strong oxidizing effect of the metallic oxide, is converted into calcium plumbate, while sulphurous

anhydride is set free. The mass then cools, as the exothermic reactions cease, and can be readily removed to a blast furnace for smelting.

NEW SAMPLING MILL AT PARK CITY, UTAH.

A new mill is being constructed at Park City, Utah, by the Park City Sampling Mill Company. In the construction of this building the aim has been to make it practically an automatic mill, with modern application of power and construction, and to be completely lighted with electricity. The growing demands of Park City and its business have made these changes necessary. This construction work is being done under the supervision of J. B. Fleming, Mechanical Engineer, formerly of the Silver King Mining Company, who has also the supervision of the work now under way for the increased capacity of Daly-Judge mill.

The plans and specifications for the new sampling mill call for a 500-ton sampling mill plant. The machinery in the mill weighs 265,000 pounds, and the material and machinery in the mill are the very best obtainable. A No. 5 Gates gyratory crusher of 40 tons hourly capacity is to be installed, the crushers to be capable of crushing to 1/4-inch cubes. It will contain 5 sets of belt-driven rolls, standard grades. Other equipment includes a complete system of bucket elevators, 5 Vezin machine samplers of heavy make, 1 Gates sample grinder, style B, and 240 feet of 24-inch Robins trough belt conveyor. The engines and Gates crushers are on hand, and the remainder of the machinery is on the road. The mill will also have one 16 by 36 heavy duty Allis-Corliss engine, 2 125 horse-power Scotch marine internally fired boilers and 2 sets of Fairbanks railroad track scales, one of 200,000 pounds capacity (64 feet long) and one of 140,000 pounds capacity. The boilers will be equipped with 2 American under-feed stokers, marine type, with automatic engines and blowers complete.

MINERAL PRODUCTION IN SWEDEN.

Official reports recently published show that the production of iron ore in Sweden in 1901 was 2,793,566 tons, an increase of 185,641 tons, or 7.1 per cent over 1900. This does not include 1,594 tons of bog ore raised. The total number of men employed in the iron mines was 10,474. Of the total ore 2,506,990 tons, or 89.7 per cent, were magnetic ore. The total quantity of rock broken in taking out this ore was 4,980,680 tons, of which 44.5 per cent was waste or barren rock. There were 29 magnetic separators in use in treating iron ore, and these machines treated 203,000 tons in all. All the figures given are in metric tons.

There were 139 blast furnaces in operation, and the total output of pig iron was 528,375 tons, an increase of 1,507 tons, or 0.3 per cent, over 1900.

The average production per furnace was 3,801 tons. All the Swedish furnaces use charcoal for fuel.

The total forged and puddled iron made during 1901, including blooms and raw bars, was 164,850 tons, a decrease of 23,605 tons, or 12.5 per cent, from 1900. The output was the smallest since 1888. The steel ingots made, including direct castings, were as follows:

	1900.	1901.	Changes.
Converter	91,065	77,231	D. 13,834
Open hearth.....	207,418	190,877	D. 16,541
Crucible	1,121	1,088	D. 33
Total	299,604	269,196	D. 30,408

The total decrease was 10.1 per cent. Of the steel made last year 156,611 tons, or 58 per cent, were acid, and 112,585 tons, or 42 per cent, were basic steel.

The total output of iron and steel in finished forms of all kinds was 356,078 tons, an increase of 64,232 tons, or 22 per cent, over 1900. The largest single item was 137,171 tons of bars, of which 31,023 tons, or 22.6 per cent, were forged iron bars, and 106,148 tons, or 77.4 per cent, were rolled from iron or steel.

The consumption of charcoal, the only fuel used in the Swedish iron industry, was 45,313,000 hectoliters. The number of motors employed was 1,691,

having a total of 72,000 horse-power. Of these no less than 1,075 having a total of 52,000 horse-power, were turbines or other water motors. Water power, therefore, formed 72.2 per cent of the power used.

Ores mined other than iron included 11,366 tons of silver-lead ore, 23,660 tons of copper ore and 48,630 tons of zinc and mixed lead and zinc ores. The production of metals included 63 kilograms gold, 1,557 kilograms silver, 137 tons copper and 985 tons lead. Part of the copper ores and all of the zinc ores were exported in their raw state.

The total coal mined in 1901 was 271,509 tons, an increase of 19,189 tons, or 7.6 per cent, over 1900. Nearly all of this was lignite, and the quality is not suited for use in iron and steel manufacture. The total number of men employed in coal mining was 2,098. The coal output was the largest on record.

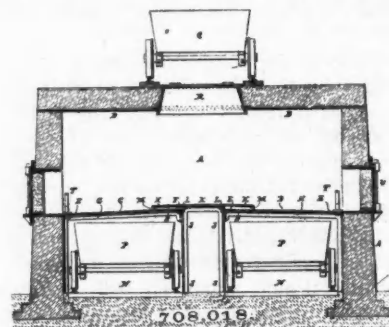
PATENTS RELATING TO MINING AND METALLURGY

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 September 2, 1902.

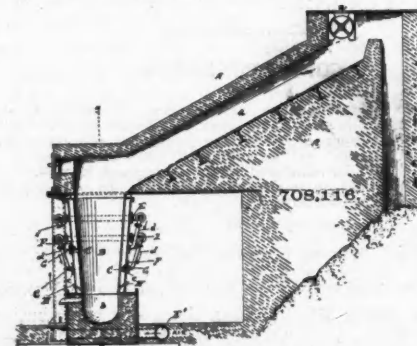
708,018. UTILIZING WASTE HEAT IN CONNECTION WITH SMELTING-FURNACES.—Richard Brown, Southampton, England. Apparatus for utilizing waste heat in connection with smelting-furnaces, comprising a covered



chamber to receive the materials for the furnace, having a floor and supported so as to form flues to receive bogies containing hot products from the furnace, the floor having openings adapted to allow air heated by contact with the hot products to ascend through the materials thereon.

708,044. PROCESS OF OBTAINING ZINC.—Evan H. Hopkins, South Kensington, England. A process of obtaining zinc free from lead from mixtures of the oxides of zinc and lead which consists in heating carbon to incandescence, heating the oxides mixed with carbonaceous materials in a closed retort and passing the products of distillation upward through the incandescent carbon.

708,116. IRON BLAST-FURNACE.—Martin P. Boss, San Francisco, Cal., assignor to Hydro-Carbon Smelting Company, New York, N. Y., a corporation of West Virginia. In a blast-furnace, a water-jacketed fire-chamber, a tuyere extending therethrough, an oil-feeder inserted through the



water-jacket of said chamber and communicating with the interior of the tuyere at a point intermediate of its ends, and an air-feeder projecting into the tuyere, and adapted to discharge at a point adjacent to the point of discharge from the oil-feeder.

708,079. PROCESS OF MAKING SODIUM CYANIDE.—Fritz Roessler, Frankfurt-on-the-Main, Germany, assignor to the Roessler & Hasslacher Chemical Company, New York, N. Y. A method of obtaining sodium cyanide, which consists in treating a mixture of sodium cyanide and sodium carbonate with insufficient water to dissolve the

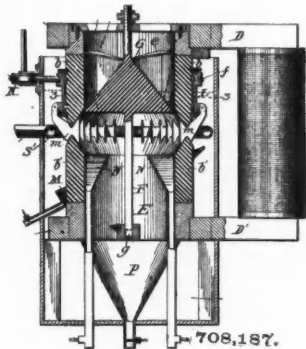
cyanide completely, forming a lye, separating the lye from the mixture, again treating the remaining mixture with such a quantity of water as is necessary to dissolve all the cyanide left in the mass after the first treatment forming a second lye, and lixiviating a fresh quantity of the mixture of sodium cyanide and sodium carbonate with the second lye, whereby the sodium carbonate in the solution is displaced by sodium cyanide.

708,107. FURNACE.—George Westinghouse, Pittsburg, Pa. In a smelting-furnace, and air-jacket consisting of wall-plates having vertical ribs and transverse baffle-plates integral with the inner surface of the plates, the baffle-plates extending across the spaces between adjacent ribs.

708,180. HYDRAULIC PRESS FOR THICK FLUID SUBSTANCES.—Gottfried von Susskind, St. Georgen, Switzerland. In a hydraulic press for thick fluid masses, rotatable receptacles, a divided mold in communication with said receptacles, means for lifting the said rotatable receptacles out of a recess in the table, mechanism for adjustably securing the receptacles to their support, and means for heating the mold and the substances under pressure.

708,186. MAGNETIC SEPARATOR. John P. Wetherill, South Bethlehem, Pa. A magnetic separator, comprising oppositely-disposed hollow magnet-poles, separated by an interpolar space or gap traversed by the magnetic lines of force, means for feeding into said gap the material to be separated, means for washing out the non-attracted particles from the particles detained by magnetic attraction in said gap, and a scraper for removing the attracted particles beyond the detaining influence of the magnetic field.

708,187. MAGNETIC SEPARATOR.—John P. Wetherill, South Bethlehem, Pa. A magnetic separator, comprising hollow tubular magnet-poles, separated by an interpolar



space or gap traversed by the magnetic lines of force, a distributing-cone within the upper pole for directing the material to be separated into said gap, a water-jet pipe whose jet-orifices are directed into the gap, and a scraper operating in the gap.

708,240. APPARATUS FOR BURNING LIME.—Garwin A. Mace, Menominee Falls, Wis. The combination of a kiln, a passage leading from the kiln back to the fire, means within the passage for drawing the hot air and gases from the kiln into said passage and back to the fire, a mixing-chamber to which the passage leads, said mixing-chamber being in communication with the fire-chamber of the kiln, a valve in the passage between the mixing-chamber and the drawing or suction means, a valve in said passage in advance of said drawing or suction means, an air-duct also in advance of the drawing or suction means and communicating with the passage, and means for feeding a fuel to the mixing-chamber, said fuel and the hot air and gases being thereby mixed and commingled in the mixing-chamber, before being finally conducted into the fire.

708,248. METHOD OF MOULDING ARTIFICIAL STONE.—Frank Orlikowski, Cleveland, Ohio. A method of making artificial stone consisting in placing within a suitable flask a compact layer of hard stone pieces; then covering said pieces at a suitable depth with a flowing cement, and then tamping the mass until solid; then spreading another close layer of hard stone pieces over said body to complete the stone and covering the same with cement to fill the interstices and overspread the same, and finally tamping the material thus added and leaving the stone with a flat finished top surface.

708,267. COATING-MACHINE. Myron A. Smith, New York, N. Y., assignor to International Machine Co., New York, N. Y. The combination with a coating-material holding tank and a perforated distributor mounted thereover, of elevator buckets arranged to raise coating material from the tank, empty it upon one end of the distributor and spread it over the entire surface thereof.

708,301. MACHINE FOR BREAKING PIG IRON.—Harry Bentley, Whitehaven, England. A machine for breaking pig iron comprising in combination with the framing and driving-gear, a main or eccentric shaft, a movable table for supporting and feeding forward the bed of pigs, a crank, levers and rods for traversing the said table, eccentrics and sheaves for raising said table, mechanism for actuating these, a toothed wedge-block for clamping the pigs, an eccentric rod and lever for actuating said block, toothed pawls for locking the wedge-block, a lever and a cam for releasing the pawls from the wedge-block, toggle

levers and an eccentric for actuating the pig-breaking ram, and an eccentric for actuating the sow-breaker.

708,325. TOOL FOR OIL WELLS, ETC.—William J. Dunlap, Etna, Pa. The combination of a casing having its upper and lower portions interiorly threaded, a sleeve threaded in the lower portion of said casing, an enlarged portion carried by the sleeve of the same diameter as the casing and having its upper side abutting against the lower edge of the casing, said sleeve and enlarged portion being apertured, a stem received within said aperture, a head on the lower end of the stem of the same diameter as said casing and adapted to have its vertical movement limited by engagement of its upper side with the under side of the enlarged portion of the sleeve, the lower end of said head being externally screw-threaded, the upper end of the stem being threaded, a nut in the upper end of the stem, a spiral spring encircling the stem and engaging the nut and the upper end of the sleeve.

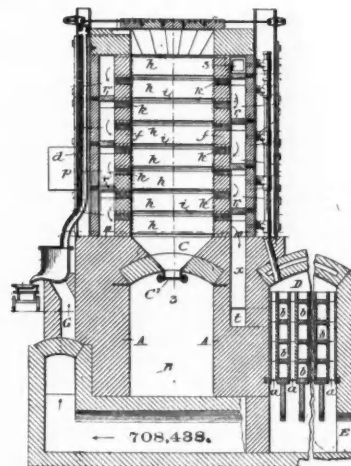
708,331. PROCESS OF TREATING FINE IRON ORES FOR BLAST FURNACES.—Alexander D. Eibers, Hoboken, N. J. A method of compacting fine iron ores, which consist in intimately mixing fine ores with moderate quantities of pulverized slag of suitable composition, and in burning such mixes to clinker under rotating action.

708,333. CYANIDE COMPOUND AND PROCESS OF MAKING SAME.—Geo. Erlwein and Albert Frank, Berlin, Germany. A composition containing cyanide of calcium destined to serve as a substitute for cyanides of the alkalis consisting in a molten mass of cyanide of calcium and a metallic chloride.

708,353 and 708,354. COMPOSITION OF FIREPROOF WALL PLASTER.—Charles R. Harris and Christopher C. Barrick, Los Angeles, Cal. A composition of matter, consisting of clay, calcined plaster, cement, asbestos fiber and glue.

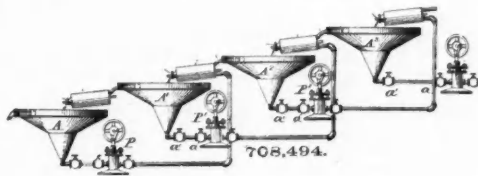
708,394. PROCESS OF BURNING BRICK.—John Peck, Haverstraw, N. Y. A process of burning brick in kilns, which consist first in subjecting the kiln to the action of a fire fed with atomized oil and maintaining this fire until the kiln has been heated, and second, in stopping in said oil-fire and continuing the burning of the kiln by a fire fed with soft or bituminous coal or other similar fuel.

708,438. ZINC FURNACE.—William C. Witherill, Joplin, Mo. A zinc-furnace provided with a series of relatively



deep, long and narrow charge-containing chambers, and removable tile combustion flues separating said chambers from each other and forming the walls thereof, whereby the furnace may be charged and discharged without dismantling it, the destructive effects of the slags are largely obviated and the loss of zinc by absorption is materially reduced.

708,494. APPARATUS FOR EXTRACTING METALS FROM ORES.—John Randall, Deadwood, S. Dak. The combination of a series of tanks with a series of agitators above said tanks and discharging into the same, so arranged that the overflow of the solvent fluid from each tank dis-

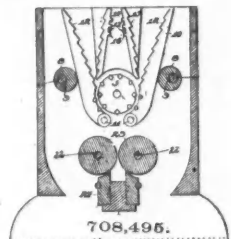


charges into the agitator over the next adjacent tank and thence into the latter, and means for conveying the ore from the bottom of each of said tanks into the agitator directly above the adjacent tank for discharge into the latter.

707,484. HOISTING-BUCKET MECHANISM.—Andrew Wirsing, Milwaukee, Wis. A separable hoisting-bucket mechanism comprising a center spindle, a bucket-section crank-arms rigid with the spindle, other bucket-section crank-arms loose on the spindle, upper arms radiating in

opposite directions from the spindle over bucket-sections and respectively fast and loose in their connection with the spindle, pulleys in suspension from these arms, an upper shell having central and end pulleys, link-rods connecting the outer corners of the bucket-sections with the shell central of the same, a suspension-cable in connection with the aforesaid shell, and a draft-cable trained in contact with the several pulleys to control opening and closing of the bucket.

708,495. STONE CRUSHER.—Daniel C. Robinson, Moxness, Pa. In a crusher, a casing, a pair of suitably-pivoted sides forming a hopper in said casing, shafts mounted in said casing carrying eccentrics for engagement with said sides, means for operating said shafts in unison, a breaking-down roll secured between said sides of the hopper, and a



pair of inclined stationary jaws above said breaking-down roll, said jaws carrying projections on their rear faces, and pins carried by the casing whereby said jaws may be adjusted.

708,504. TREATMENT OF ORE-SLIMES.—Henry L. Sulman and Hugh F. Kirkpatrick-Picard, London, England. A process of treating ore-slimes which consists in separating by means of a centrifugal machine the ore-slimes from the residual water with which they are mixed by adding a little lime to the charge, removing the bulk of the water, thereafter introducing into the machine an amount of leaching solution of a volume equal to that of the remaining quantity of adhering moisture and introduced into the slimes by centrifugal action, and replacing the moisture by the added leaching solution.

708,510. PROCESS OF TREATING GAS TAR RESIDUM.—John T. Lowe, Boston, Mass., assignor of two-thirds to Milton P. McLaughlin, Somerville, and Joseph N. Smith, Wollaston, Mass. A process of treating the residuum obtained in the manufacture of gas, which consists in agitating said residuum together with water to reduce it to a liquid mass of uniform consistency, and then separating from said mass the free water to produce a liquid product having a uniform and predetermined consistency.

Reissue No. 12,027. CASTING APPARATUS.—David T. Croxton, Canal Dover, Ohio. Original No. 650,373, dated May 29, 1900. In casting apparatus, in combination, a rotary wheel, molds rotatably mounted thereon, a track located beneath the casting-molds, cars or trucks coupled in a continuous endless chain, and connected to the rim of the mold-supporting wheel, a water tank located in the car track, and having the car track depressed and attached to the bottom of said tank, whereby the cars will be drawn through the water for cooling the pigs.

GREAT BRITAIN.

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

Week ending August 21, 1902.

15,541 of 1901. GOLD RECOVERY.—J. B. de Alzugaray, London. A gold extraction process consisting of mixing the pulp with a solution of cyanide, salt, and soda and heating the mixture in an airtight vessel with bromine, thus forming cyanogen bromide, which will act as solvent for the gold.

18,949 of 1901. TEMPERING STEEL.—M. Hirschmann and O. Heilmeier, Nuremberg, Germany. Retempering tool steel by plunging it at a red heat into a mixture of resin, sulphate of copper, bone dust, borax and salt.

19,241 of 1901. COKING PEAT.—M. Ziegler, Berlin, Germany. Improvement on the arrangement of flues in ovens for coking peat.

3,802 of 1902. REVOLVING SCREEN.—W. H. Baxter, Leeds. A cylindrical revolving screen made in sections each of greater diameter than the one in front, so as to allow the larger materials to easily flow down to the sections of larger diameter at the end nearest the outlet.

9,890 of 1902. STEEL MAKING.—E. C. Wills and H. Evans, Philadelphia, U. S. A. An improved intermediate cupola or ladle with tuyeres for use in steel making.

11,675 of 1902. MINING CARTRIDGES.—Miners' Safety Explosives Company, London. Construction of mining cartridges so as to allow several to be rammed close end to end in one hole without damaging each other.

13,757 of 1902. UTILIZING BLAST FURNACE GASES.—Abwarmer Kraft Maschinen Gesellschaft, Berlin. The use of blast furnace gases for driving engines where ammonia or carbonic acid is the fluid medium.

13,761 of 1902. MINING MACHINE.—Morgan Gardner Electric Company, Chicago, U. S. A. Improvements in the inventor's longwall mining machines.

PERSONAL.

Mr. P. L. Kimberly is looking after his properties at Leadville, Colo.

Mr. R. H. Kleinschmidt has returned to Butte, Mont., from Dawson, Y. T.

Messrs. Frank H. Buhl and W. L. Wallis have returned to Sharon, Pa., from Utah.

Dr. L. L. Hubbard, of Houghton, Mich., returned recently from a visit to Butte, Mont.

Mr. N. B. Knox, of San Francisco, has been examining mining property at Kendall, Mont.

Mr. P. Wiseman has resigned as general manager of the Shannon Copper Company, Arizona.

Mr. J. A. Teagarden, of Boulder, Colo., recently visited Reno, Nev., to examine mining property.

Mr. William R. Boggs, Jr., lately returned from France, has sailed for South America on a business trip.

Mr. Mills Williams has been appointed foreman of the Globe-Boston Copper Mining Company, at Globe, Ariz.

Mr. J. R. Finlay has been appointed manager of the Portland Mine, at Cripple Creek, Colo. Mr. J. F. Burns is general manager and president.

Mr. A. Hiorns is mine manager of the Kwandang-Soemalata Mining Company at Soemalata, North Celebes.

Mr. H. L. Kopp, of Sonora, Cal., is now in Chemulpo, Korea, erecting an 80-stamp mill for a mining company.

Mr. W. H. Adams, of New York City, has been in San Francisco, Cal., from an Alaskan examination of copper property.

Major A. V. Bohn, who has been looking after mining interests in Utah, has returned to his home at Leadville, Colo.

Mr. Louis Bamberger has returned to Salt Lake, Utah, from an extended trip through several of the mining camps of Idaho.

Mr. A. W. Davis, of Providence, R. I., has been visiting mining properties in the Chiricahua Mountains, Cochise County, Ariz.

Mr. R. T. Hanscome, of the General Electric Company, is in Calumet, Mich., on business connected with the Calumet & Hecla Mine.

Mr. William V. Casey has returned to Boulder, Colo., from a trip to Salmon City, Idaho, where he examined mining properties.

Dr. F. P. Graves has resigned the presidency of the University of Washington. Prof. T. F. Kane has been elected acting president.

Mr. Simon Bamberger, president and general manager of the Bamberger-De Lamar Gold Mines Company, has been in Salt Lake, Utah.

Mr. Samuel Collins, of Boston, Mass., who is heavily interested in mining at Leadville, Colo., is spending a few days at that camp.

Mr. G. Lavagnino, mining engineer, of Salt Lake, Utah, is in New York, having just returned from a stay of several months in Europe.

Mr. Frank Lewis Nason has gone to Canada to report on the Golden Fleece Mine, and also to examine iron properties for New York parties.

Mr. Barry Searle has been inspecting mining properties near Pony, Mont., in the interest of the Exploration Company of London, England.

Dr. A. H. Eftman, mining engineer, of Minneapolis, Minn., is making a professional trip to the Black Hills, and to Gilpin and San Juan counties, Colo.

Mr. C. Linn, of the railroad department of the General Electric Company, was in the Lake Superior copper district for a few days recently on a vacation.

Capt. Thomas Hoatson, of Calumet, Mich., was recently in Milwaukee, Wis., attending to machinery contracts for the Calumet & Arizona Mining Company.

Capt. W. A. Dunn, in charge of exploratory work at the Weyerhaeuser property, on the Douglass copper range, in Wisconsin, visited the Michigan copper district recently.

Mr. W. F. Kennedy, secretary of the Globe-Boston Copper Company, who has been inspecting the company's property at Globe, Ariz., has returned to Leavenworth, Kan.

Mr. M. C. Harrington, general manager of the La Plata Consolidated Mining Company, who has been on a three months' trip to Ireland, has returned to Salt Lake, Utah.

Mr. S. W. Winn, of Chicago, accompanied by Mr. R. Guenther, of Utah, has been investigating the properties of the Mineral Mountain Mining Company, near Lordsburg, N. M.

Mr. N. J. Martin, who recently-resigned as superintendent of the mines of the New York & Honduras Rosario Mining Company, at San Juancito, Honduras, is at Lewiston, Idaho.

Mr. Thos. Kavanagh now has charge of the Troy-Manhattan Copper Company's property at Troy, Ariz. Manager C. H. Cutting has transferred his headquarters to New York City.

Mr. Hudson H. Nicholson, of Denver, Colo., consulting engineer of the Hamilton Mine at Breckenridge, Colo., is overhauling the stamp mill. A new mill will probably be constructed next year.

Prof. John B. Ekeley has been elected professor of chemistry at the University of Colorado to succeed Dr. Chas. S. Palmer, who has been called to the presidency of the Colorado State School of Mines.

Messrs. Charles Whealen, of Dayton, O., and Chester A. Hoag and J. D. Paget, of Newark, N. J., have been inspecting the Gold Pan Mining Company's placer operations near Breckenridge, Colo.

Mr. Frank M. Smith, who has been assistant manager of the American Smelting and Refining Company's business at Salt Lake, Utah, for nearly a year past, has left for his new post at Helena, Mont.

Mr. W. K. Field, vice-president of the St. Paul & Western Coal Company, of St. Paul, Minn., has been appointed vice-president of the New Pittsburg Coal Company with headquarters at Columbus, O.

Mr. A. Houle, who has been for a year smelter superintendent for the Old Dominion Company, Globe, Ariz., has accepted a similar position with the North American Copper Company at Encampment, Wyo.

Messrs. McLean and Probert, consulting mining engineers, of Los Angeles, Cal., are at Globe, Ariz., making a thorough examination of the mines and smelter of the Old Dominion Copper Company for Boston men.

Mr. F. Milton Johnson, mining engineer, of Boston, Mass., sailed from New York City on the *Philadelphia* on September 17 to visit Brazil to examine some diamond properties. He expects to be gone about six months.

Mr. David Gough, general manager of the Descubridora Mining and Smelting Company, of Descubridora, Mex., is visiting New York City. He may arrange for placing orders for a substantial lot of equipment.

Dr. Charles H. Bruner, of Fremont, Neb., has been in Salt Lake, Utah, on his way to Oregon to inspect his mining interests near Granite. He is largely interested in the Consolidated Mercur and other Utah propositions.

Mr. C. L. Griesbach, director of the Geological Survey of India, to which post he was appointed in July, 1894, retires from service at the end of the year. He was appointed to the Survey in September, 1878. Mr. R. D. Oldham will succeed him.

Mr. Frederick Carpenter, of Springfield, Mass., who has been looking after Fogg & Co.'s interests at Leadville, Colo., is now in Arizona with Mr. J. W. Deane, of Leadville, examining some copper and gold properties near Tombstone.

Mr. Seymour W. Tullock, of Washington, D. C., has been visiting Kimberley, Utah, for the past few days inspecting his interests. Mr. Tullock is vice-president of the Sevier Consolidated Company's group of claims in which Washington and New York City men are interested.

Mr. James M. Baldwin, one of the superintendents of the West Africa Hinterland Consolidated Mining Company, who has been in Lead, S. Dak., is about to return to Ashantee, Africa, accompanied by Mr. Charles Henley, of Central City; Dr. E. S. Smith, of Keystone, and several other Black Hills men.

Mr. George S. Waterlow and Dr. H. Lewis Jones, of London, England, who have been in the West Kootenay and Boundary districts of British Columbia, are directors of the British Columbia (Rossland & Slocan) Syndicate, Limited, and the Snowshoe Gold and Copper Mines, Limited. Mr. Waterlow being chairman. After looking into affairs at Rossland they spent a few days at the Snowshoe Mine, near Phoenix. They were accompanied by Mr. Anthony J. McMillan, of Rossland, managing director in British Columbia for both companies.

Mr. Thomas Cornish, of Georgetown, Colo., is now superintendent of Stratton's Independence, at Cripple Creek, Colo., in place of Mr. A. J. Shipman, who resigned. Mr. Cornish was at one time in charge of the Smith-Moffat operations, and has recently been doing general expert work. Several of the foremen and department managers under Mr. Shipman have tendered their resignations, which have been accepted by Mr. A. Chester Beatty, representative of the Venture Corporation of London. Among those who will be replaced are Mr. J. I. Grant, assistant manager, Mr. Samuel Loebb, superintendent, and Mr. Lee Glockner, manager of the ore department.

SOCIETIES AND TECHNICAL SCHOOLS.

PURDUE UNIVERSITY.—This institution, at Lafayette, Ind., has opened with 1,052 students in the scientific and engineering courses. The total attendance will reach 1,400. Students from India, Japan, Mexico, Porto Rico and the Philippines have registered. Thirty new professors and instructors have been added to the faculty.

BUTTE SCHOOL OF MINES.—This school, at Butte, Mont., has begun work for the new year. The faculty for the ensuing year will consist of: President N. R. Leonard, mathematics; Prof. E. H. McDonald, mining engineering; Dr. C. A. Deihl, assistant professor in chemistry; Prof. W. G. King, chemistry and metallurgy; Prof. A. N. Winchell, mineralogy and geology; Prof. C. H. Bowman, mechanics and electrics; Prof. L. R. Foote, preparatory department.

UNIVERSITY OF ILLINOIS.—The university has installed a 440-volt plant for the lighting of the 5 new buildings at Champaign. Two-phase alternating current will be used, and each phase will be treated as a single-phase circuit operated on the 3-wire system, the neutral wire being supplied with current from an auto-transformer. The exhaust from the steam engine plant operating the generators is to be used in heating the buildings. The generating station contains 2-belted 2-phase generators, one of 50-kw. and one of 75-kw., operated at 440 volts, to which will shortly be added an engine-type, revolving field, 120-kw. alternator, purchased from the Westinghouse Electric and Manufacturing Company.

INDUSTRIAL NOTES.

The Chicago Virden Coal Company, at Virden, Ill., has installed a Victor box-car loader.

The Jordan Coal and Coke Company has moved its headquarters from Clinton to Kansas City, Mo. The company's mines are at Deepwater, North Station and Brownington, Mo.

The branch house of Crane Company, of Chicago, Ill., at Salt Lake, Utah, is in charge of William Bowen. The branch house carries in stock a complete line of Crane Company's goods.

The new plant of the Millers Falls Paper Company, at Millers Falls, Mass., will be electrically driven throughout. Contract for the entire equipment covering generators, motors, arc and incandescent lights, etc., has been placed with Sargent, Conant & Co., of Boston, Mass.

The Marion Steam Shovel Company, of Marion, O., has booked an order for 8 large steam shovels for iron mines in the Lake Superior District, and reports many other orders. In fact, it has more orders booked now than ever at one time in its history. The order for 8 shovels is for spring and summer delivery in 1903.

The Mexican Dynamite and Explosives Company, which concern holds a concession from the Mexican Government and is operated by French capital, is reported to have closed a contract with W. E. Giesecke, of Mexico City, for the construction of a factory at Tinaja, in the district of Mapinu, State of Durango.

A contract has been awarded to the Bullock Manufacturing Company, of Cincinnati, O., to supply all the electrical machinery required by both the battleship *New Jersey* and the cruiser *Des Moines*, both of which are now under construction. This contract includes everything of an electrical nature on both ships, and is valued at \$100,000.

The Crescent Portland Cement Company, of Wampum, Pa., organized to succeed the National Cement Company, has installed new machinery and increased its output to 500 bbls. per day. The company has \$100,000 capital stock, and is composed of W. J. Prendice, president; R. M. Highes, New Castle, secretary, and George W. Hackett, Beaver, treasurer. The other directors are C. M. Hughes and Judge H. Wilson.

The magnesite brick plant of the Fayette Manufacturing Company, being erected at Chester, Pa., will be the largest of its kind in the country. It is expected that the works will be in operation about the middle of October. The officers are William A. Stanton, president; Frank H. Seely, treasurer, and Edward M. Allen, of Philadelphia, secretary, and Robert G. Griffiths, of Chester, general superintendent.

The Williamson Iron Company has been reorganized with Frederick D. Dimmick, president; J. B. Simpson, secretary, and Thomas J. Edwards, general manager. Mr. Edwards has been with the Jenifer Furnace Company and the Sloss-Sheffield Steel and Iron Company. He has started repairing the 75-ton furnace in Birmingham, Ala., expecting to get it ready for operation by October 15. The company has not sold any iron ahead.

At the recent annual meeting of the stockholders of the American Smelting and Refining Company, the following directors were re-elected: E. W. Nash, Dan-

iel Guggenheim, Barton Sewell, Isaac Guggenheim, A. Eilers, Morris Guggenheim, A. R. Meyer, Solomon Guggenheim, J. B. Grant, Simon Guggenheim, Dennis Sheedy, M. D. Thatcher, N. Witherell, D. H. Moffatt, Grant B. Schley, H. L. Terrell, Guy C. Barton and Henry L. Higginson.

James W. Copeland, of No. 934 Equitable Building, Denver, Colo., has been appointed sole agent for the State of Colorado for the Scaife and We-Fu-Go water softening and purifying systems, manufactured only by Wm. B. Scaife Sons' Company, Pittsburg, Pa. Mr. Copeland was formerly located at St. Paul, Minn., where he was a successful manufacturers' agent, and is well known throughout the West in engineering circles. He has always given the subject of water purification considerable attention.

The Union Steel Company, of Pittsburg, Pa., will adopt electrical power distribution for its new mills. Steam engines, driven by waste gases from the blast furnaces, will distribute electric power in the form of alternating current to rotary converters at the mills, where it will be used largely as direct current. The Union Steel Company has recently purchased from the Westinghouse Electric and Manufacturing Company 2 800-k.w. alternating current generators, an 800-k.w. direct current generator and 5 rotary converters.

Allis-Chalmers Company recently received at its Denver office an order for all the machinery necessary to increase the bromide plant of the Telluride Reduction Company at Colorado City, Colo., from 100 tons of ore to 300 tons per day. The increase consists in part of 2 100-ton Wethey mechanical roasting and cooling furnaces, 2 100-ton revolving driers, 4 large sets of rolls, the necessary Montejus tanks, elevators, screens, etc., aggregating 300 tons of machinery. The Denver office also reports the sale of a first motion hoisting engine to the Theresa Gold Mining Company, of Goldfield, Colo.

The Guarantee Electric Company, of Chicago, Ill., reports that business has been exceedingly good, and that 1902 will prove its most successful year. Some time ago it found business increasing so rapidly that it secured a lease in the new Borden Building, Clinton and Adams streets, into which it has just moved. It now has more floor space, will carry a larger stock of machines, and is prepared to meet every emergency. The growth of the firm's repair department has been very gratifying. The new shops are large and well lighted and fitted with all modern appliances for handling electrical apparatus of every description promptly and effectively. There has been no change in the management during the year. Chas. E. Gregory is still president, with G. B. Shaw treasurer and A. T. Walcott superintendent.

Probably the largest elevator contract ever awarded was closed recently by the Otis Elevator Company with the Metropolitan Life Insurance Company for the additions to the building at Fourth avenue, Twenty-third and Twenty-fourth streets, New York City. The new equipment consists of 23 high-pressure passenger elevators, 4 hydraulic freight elevators and 2 electric passenger elevators, and contemplates converting the 13 passenger elevators in the original building so as to operate them at the increased pressure. The plant, when complete, will consist of 40 hydraulic elevators, operated from one pumping station. Messrs. N. LeBrun & Sons are the architects, and V. J. Hedden & Sons builders.

Two important New York City contracts closed last week, besides that for the Metropolitan Life Building, include the Hotel Imperial Annex, with 7 hydraulic and 2 electric elevators, also the Blair Building, with 6 hydraulic elevators.

The Bon Air Coal and Iron Company, of Nashville, Tenn., recently organized with a capital of \$5,000,000, half of which is preferred and the remainder common, is a consolidation of the Bon Air Coal Company and the Buffalo Iron Company. John P. Williams has been elected president; J. M. Overton, vice-president and general manager; C. Cooper, treasurer, and W. C. Dibrell, secretary. The following are directors: John P. Williams, J. M. Overton, W. C. Dibrell, S. J. Keith, A. H. Robinson, M. M. Gardner, J. H. Fall, J. M. Dickinson, Edgar Jones, T. M. Steger, and S. Murray. The Executive Committee is: S. J. Keith, M. M. Gardner, A. H. Robinson, Edgar Jones and W. C. Dibrell. As the four furnaces of the Buffalo Iron Company receive their supply of coke from ovens in Virginia and West Virginia, the consolidation was made desirable owing to the large coal properties owned and controlled by the Bon Air Coal Company. It is intended to develop considerable of this property and several coking plants will be built.

TRADE CATALOGUES.

The Cosmopolitan Power Company, of Chicago, Ill., issues an illustrated pamphlet describing the company's improved surface condenser for steam engines.

The Bemis & Hall Hardware and Tool Company, of

Springfield, Mass., publishes a 24-page catalogue of its wares. These include dividers, calipers, punches, saw sets, steelyards, monkey-wrenches, pipe wrenches and patent combination wrenches.

A little pamphlet sent out by the Globe Iron Works, of Stockton, Cal., describes the power transmission appliances made by that company. The list includes Globe adjustable hangers, Globe boxes, shaft couplings, shafting, etc. The company also carries in stock Medart steel rim, wood split, cast iron and American all-wrought steel pulleys.

Rock drills, accessories and air compressors, as manufactured by the Champion Rock Borer and Air Compressor Company, of 63 Queen Victoria street, London, E. C., are described in an illustrated pamphlet issued by the company. The illustrations show the details of construction, and a telegraph and cable code for ordering parts of machines is added to the catalogue.

Under the title of "The Song of the Elevator," the A. Leschen & Sons Rope Company, of St. Louis, Mo., has gotten out a little book of verses, telling the story of an elevator—the tribulations of its poor ropes, with the consequent frequent stoppage for repair and the obvious moral. It is a quaint conceit, and will appeal to all interested in elevator construction, operation and care.

A stock list of second-hand machinery sent out by A. F. Bartlett & Co., of Saginaw, Mich., contains price lists of cold rolled polished steel shafting, boilers, vertical and horizontal engines, steam pumps, and in particular an unusually full line of sawmill machinery, including circular saws, carriages, trimmers and edgers, filing room machinery, woodworking machinery, conveyor chains, rubber and leather belt, etc.

The Kilborn & Bishop Company, of New Haven, Conn., manufacturing drop forgings and forged hardware, has issued a little pamphlet describing some of its products. The company makes plyers, saw sets, cold chisels and in particular the Atlas pipe wrench, for which some excellent features are claimed. A set of 4 of these wrenches will handle all sizes from 1/2-in. wire to 4 1/2-in. pipe. The Kilborn & Bishop Company states that it has excellent facilities for making special drop forgings to order from steel, iron and copper.

A general descriptive 64-page catalogue of the Stromberg-Carlson Telephone Manufacturing Company, of Chicago, Ill., describes the company's telephones, switchboards, lightning-aresters, transmitters, receivers, and telephone supplies. The company states that it makes every detailed part under its direct supervision from the raw material, and aims at the highest standard of excellence. It will furnish any and all material or supplies required to build and maintain telephone stations or lines at any time.

The Northern Electrical Manufacturing Company, of Madison, Wis., has issued bulletin No. 29, an illustrated pamphlet of 32 pages, describing the company's multipolar motors. The company recommends these motors for use in driving tools and appliances used for iron working, or for ventilating and pumping machinery, hoisting and conveying apparatus, mining and smelting machinery, coal-handling machinery, chemical works equipment, etc. The construction of the motors is clearly shown, and their application to various machines.

A circular sent out by C. A. Hammel, of Los Angeles, Cal., calls attention to some tests of the Hammel oil burner on the San Pedro, Los Angeles & Salt Lake Railway. The engine was a 10-wheel Brooks and drew 4 passenger cars. The distance was 28 miles up a 1-6 per cent grade. Six tests showed these results: Average bbls. oil per trip, 3.35; average gals. water per trip, 2,029.5; evaporation at 60 deg., 14.99; evaporation from and at 212 deg., 18.19; oil per car per mile, 1.25 gal; oil asphaltum base of 15 gravity, 8 lbs. per gal; water, 8.33 lbs. per gal; no water blown out of boiler between measurements. The advantages claimed for this burner over others are that it uses less steam and perfectly atomizes the oil.

An interesting catalogue, issued by the Union Steam Specialty Company, of Scranton, Pa., contains excellent descriptions of indicators, reducing wheels and planimeters, with cuts which show plainly the construction and method of using such instruments. Among the instruments described are the Lippincott planimeter and the Lippincott steam separator. The latter was fully tested at Cornell University, and the results given show its efficiency in allowing only dry steam to reach an engine. Brief mention is made of the shaking grates furnace blower, oil filters, duplex pumps and other specialties of the company. The descriptions of the indicator and planimeter are clearly written, and the pamphlet should be of interest to all stationary engineers. A copy will be sent by the company to any engineer sending the names and addresses of a few other engineers.

The American Ship Windlass Company, of Providence, R. I., publishes a 260-page catalogue describing the "Providence" windlasses and capstans. The company was the first to make an iron windlass, that

it states has been in continuous operation for over 45 years, and has always produced the highest grade of machinery. The company's products include hand, steam and electric windlasses, capstans, gypsies and winches, automatic steam towing machines, automatic steam riding windlasses, wharf drops, barring engines and anchors. The company also manufactures a patent automatic lubricator for oiling the teeth of worms and worm-gears. The company's barring engines for starting the main engine of a plant are made either vertically or horizontal, and are used by some very large industrial concerns.

The spitzkasten or hydraulic classifiers manufactured by the Denver Engineering Works Company, of Denver, Colo., are described in the company's new bulletin, No. 1,016, a 12-page pamphlet. The company states that it has designed and developed for commercial use these spitzkasten from experiments made by Prof. Robert H. Richard, of the Massachusetts Institute of Technology. The classifiers consist of a series of compartments, beginning with one of a determined cross-section, followed by others of increasing cross-section. The coarsest particles settle in the first compartment. As the velocity of the stream is checked by the larger size of the next compartment, particles of the next smaller size settle, and so on. The bulletin contains some useful tables of specific gravities of minerals, multipliers for obtaining approximate diameter of quartz grains settling in a mass of grains of different minerals, and the screen-mesh and maximum size of particles passing through various screens. These features alone are enough to make the pamphlet worth the attention of all mill men.

The Allis-Chalmers Company, of Chicago, Ill., has issued the 11th edition of catalogue 4 on "Gold and Silver Milling." This catalogue is a book of 268 pages, finely illustrated and well printed. It describes Gates, Blake and Dodge ore crushers, Challenge feeders, suspended automatic feeders, battery screens, mortars, stamp shoes and dies, cams, including the Blanton cams, stamp guides and other stamp-mill supplies, and 2 and 3-stamp batteries; also heavy steam stamps, including the Reynolds steam stamp and the Tremain mill. Under gold mills, the catalogue gives considerable information regarding the design of stamp mills, with plans of some large mills equipped by the Allis-Chalmers Company. Under the head of concentrating mills, a full description is given of the construction and operation of the Frue vanner. The silver milling machinery described includes wet and dry mills, including the Boss continuous process. The catalogue also contains a description of revolving ore dryers, the Stetefeldt revolving ore dryers, White-Howell, Bruckner, Brown, Wethey and Jackling roasting furnaces. Huntington mills, improved Chilean mills and the Gates Chilean mill are also described. Of other devices shown are the Ayton intermittent thick pulp extractor and the Lamb automatic sampler. The pamphlet contains a large amount of interesting information, and should be on the desk of every mill superintendent.

GENERAL MINING NEWS.

Mineral Oil Exports.—In August the United States exports were: Crude, 10,492,497 gals.; naphthas, 1,903,611 gals.; illuminating, 62,208,052 gals.; lubricating and paraffin, 7,551,502 gals.; residuum, 5,949,801 gals.; total, 88,105,443 gals., as against 92,821,602 gals. in the same month last year. In the 8 months ending August 31 the exports totaled 693,375,267 gals., against 683,861,499 gals. last year, showing an increase of 9,513,768 gals. chiefly in crude oil and residuum.

Pipe Line Returns.—There was a heavy decrease in the pipe line stocks during August consequent upon a large increase in the demand for both Pennsylvania and Trenton Rock oils, says the Oil City *Derrick*. At the same time there was a drop in the production of Pennsylvania and a decline in the output of Lima oil. The net decline in the stocks of Pennsylvania and Lima oil during August was 422,377 bbls., and the stocks at the close of the month were the smallest in two years. The runs of Pennsylvania oil averaged 85,940 bbls. a day, or 3,662 bbls. less than for July. The August shipments of Pennsylvania oil were 93,911 bbls. a day, a gain of 5,503 bbls. on the average for July.

The net stocks of Pennsylvania oils were 6,896,507 bbls. on August 31, the lowest point touched since April, 1896. Adding the net stocks of the Buckeye and other lines handling Lima oil makes a total of 25,049,636 bbls in iron tanks at the close of August.

There was a decline of 259,532 bbls. in the net stocks of Pennsylvania and of 162,845 bbls. in the stocks of Trenton rock oil during August, which is a total decrease of 422,377 bbls., or about 13,625 bbls. a day.

The average daily runs from the Lima oil sections of Northwestern Ohio and Indiana for August were 57,310 bbls., which was only 504 bbls. less than the July average. The shipments of Lima oil for the past three months have been very large, and those for

August were the heaviest since November, 1898. The August record was 67,950 bbls. a day, a gain of 3,596 over the figures for July. In August the total runs of the Pennsylvania and Trenton rock oil fields were 143,250 and the shipments 161,861 bbls. a day.

Chesapeake & Ohio Railway Company.—Coal shipments in July were 19,190 short tons from New River; 18,294 tons from Kanawha and 7,986 tons from Kentucky; total, 45,570 tons, as against 408,201 tons in the same month last year. There were also carried this year 3,876 tons foreign coal, against 2,661 tons in July last year. Coke shipments amounted to 7,715 tons from New River, and 1,158 tons from Kanawha; total, 8,873 tons, against 29,751 tons last year. The foreign coke carried was 307 tons, against 1,763 tons in July, 1901. The bulk of the shipments was for Western consumption.

(From Our Special Correspondent.)

Pine Mountain Mica and Asbestos Mining Company.—This corporation, in which Indianapolis, Ind., men hold a majority of the stock, is capitalized at \$1,000,000. The company holds options on mica and asbestos properties in Georgia and North Carolina, and also has deeds to 2,500 acres of land that contains 11 mica mines and 2 asbestos mines. The company will build mills at Pine Mountain, operated by water-power. Daniel Leslie, of Indianapolis, is president, and C. M. Travis, secretary.

ARIZONA.

GRAHAM COUNTY.

Arizona Copper Company, Limited.—This company informs us that the ore production of its mines at Clifton for the month of August was equivalent to 1,255 tons of copper (2,000 lbs. each).

MOHAVE COUNTY.

(From Our Special Correspondent.)

Great West.—This mine in San Francisco District south of Desert Station has all the ore it can handle for its 2-stamp mill. Ed. Toby is superintendent.

Maguire.—This mine 4 miles west of Kingman has a blanket vein of free milling gold ore, which is being operated by A. J. Pickrell, of Prescott.

Mineral Park Gold Mining Company.—This company's claims are at Mineral Park. Chas. E. Sherman, of that place, is one of the directors.

Nighthawk.—Ben Doran, superintendent of this mine at Layne Springs, has machinery on the ground for a mill. It is said the shaft will be sunk to 1,000 ft.

Oro Plata.—This mine near Cerbat is again worked by its owner, J. W. Gerritt, of Kingman.

YAVAPAI COUNTY.

United Verde.—At this mine at Jerome only 2 men are now left of the office force, Superintendent H. J. Allen and Chief Clerk Strothoff. Only one train daily runs over the narrow gauge road to Jerome Junction. In all about 1,000 men have been thrown out of employment. The manufacture of cyanide acid gas on a large scale will be started and a trial made of extinguishing the fire in the stopes by this means. Everything indicates that the mine and smelter will be idle for months.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Edinburgh.—In this mine, at Wieland, sinking goes on day and night. Very little water is encountered. David Fisher is superintendent.

Mitchell.—This mine, at Pine Grove, has closed. The mine has a new mill, and the shut down is thought to be temporary. L. C. Hyner, the superintendent, is trying to make arrangements for further sinking.

Zeila Mining Company.—Timber for repairing and re-timbering the shaft at Jackson down to the 400 ft. is being hauled in. The mill will probably be shut down during the 3 months required for the work.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Duchess Mining Company.—This mine, at Vallecito, owned by an Indianapolis, Ind., company, of which Charles Lily is president and W. E. Emery secretary, has temporarily closed from lack of water to run the mill and compressor.

Golden Quartz Mining Company.—This mine, near Vallecito, owned by an Oakland company, has been in litigation. This litigation has been settled, and it is expected that work will soon begin.

Lloyd Placer.—This mine, on Central Hill, near San Andreas, bonded by the Southern Pacific Oil and Development Company, of Boston, Mass., has its shaft down to bed-rock. Mr. Ames is superintendent.

Lookout.—At this mine, near San Andreas, John C. Jens has begun development. The mine adjoins the Gottschalk on the north.

DEL NORTE COUNTY.

(From Our Special Correspondent.)

Yates.—W. Burgemester, purchaser of the Yates black sand mine, on the ocean beach not far from Crescent City, has finished the preliminary prospecting and communicated results to his Philadelphia associates. It is expected that machinery will be used to work large quantities of auriferous beach sand.

ELDORADO COUNTY.

(From Our Special Correspondent.)

Eureka Slate Quarry.—In this quarry, near Kelsey, they are driving two tunnels for the purpose of opening it sufficiently to use channeling machines and do away with the blasting, which now shatters the slate too much. The quarry produces about 500 squares a month, which readily sells at \$7 per square. An air compressor is being put up.

Golden Gate Mining Company.—Work is to start at once on this mine, at Grizzly Flat. James Richards is superintendent. Eastern capital has been interested, and a shaft is to be sunk. A hoist, buckets, etc., has been ordered.

INYO COUNTY.

(From Our Special Correspondent.)

Cecil R. Mining Company.—Los Angeles men are developing mines in Park District, north of Jahannesberg. A 2-stamp mill is doing test work. Seven claims are worked. The following Los Angeles men are interested: W. T. Carter, A. W. Graybill, C. R. Faulstick, F. K. Rule and U. S. Todd.

Dunphy.—On this mine, at Keeler, the Troeger Brothers will shortly erect a hoist.

Eva Belle.—J. C. McMillan and F. K. Andrews are shipping high-grade ore from this mine just across the summit of the White Mountains from Laws. Work has been going on all summer with encouraging results.

Golden Argus Mining Company.—A 5-stamp mill is being put up at this mine at Snow's Canyon about 20 miles from Ballarat, and concentrators and a cyanide plant are to be added.

Ibex Springs.—Judge L. Bethune and Arthur Hoff, of San Bernardino, have bonded 3 claims at Ibex Springs in the Funeral Range in the Death Valley region to Eastern men for \$12,000. The ore runs high in lead and carries some silver.

KERN COUNTY.

(From Our Special Correspondent.)

A company composed largely of Santa Fe Railroad officials is opening a 14-ft. vein of gold ore about 10 miles from Bagdad. The ore is teamed to Bagdad, and then shipped to the mill at Barstow.

Bagdad Mining and Milling Company.—This company's mines, near Ludlow, are now employing 60 men and turning out 100 tons ore daily, about 30 tons of which are sent to the Barstow Mill, the balance being piled up to await the completion of the railroad from Ludlow to the mines. The ore runs from \$8 to \$40 per ton.

Lida.—E. M. Hamilton, owner of this mine, at Rosamond, has bought Willow Springs, and will pipe water to his 5-stamp mill at the Lida. He intends also to erect a 10-stamp mill at Willow Springs for custom work.

Yellow Aster Mining Company.—At this mine, at Randsburg, John Singleton manager, Mrs. R. L. Burcham secretary, the 100-stamp mill is now running. At the Goler wells the new well will be connected with the old one by a 270-ft. tunnel below water level. Both mills will soon be running.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

After Gold Mining Company.—This Los Angeles company owns 30 full claims in Horse Canyon, a branch of San Gabriel Canyon, 16 miles from Azusa, and is working 3 claims.

American Iron Company.—This company, with offices in the Bryson Block, Los Angeles, has started working iron ore at Russ Station on the railroad not far from Surrey. Oil and charcoal are used for firing the experimental smelter. The lime stone comes from Tehapal. The first run has been made.

MONO COUNTY.

(From Our Special Correspondent.)

Blind Spring Hill.—Six men are taking out ore from this claim under superintendence of J. C. Miller, and a number of individual prospectors are shipping to the Selby Smelting Works on San Francisco Bay.

MONTEREY COUNTY.

(From Our Special Correspondent.)

Los Burros.—This camp, sometimes known as the Cruikshank, has now several mines at work, and others are to be re-opened. It is the only gold camp in the Coast Range where quartz is worked. Some years ago considerable gold was taken from the Cruikshank Mine, which yielded some very fine specimen

rock, but it was finally shut down, and the camp has been practically idle some years. The Ajax lode, on Ajax Hill, is being opened in 3 places. The Cold Spring, owned by James Krinkle and S. O. Pugh, is being developed, and some ore is being milled. The Mariposa, owned by Pugh & Castro, shows the same kind of ore. The easterly claim on the lead, the New York, is owned by Cruikshank & McCormack, and is being opened. There is a 3-stamp mill in the district owned by S. O. Pugh. The Grizzly claim is being re-opened and a 2-stamp mill is to be provided. Another abandoned mine being re-opened is the Protection, owned by Krinkle & Pugh. The most noted mine of the camp is the Cruikshank. It has been in litigation some time, but is now to be re-opened. The Huntington mill was only run a short time by the company and subsequently by leasers. There are numerous small prospects being opened. Mansfield is the post-office for the camp.

NEVADA COUNTY.

North Star Mines Company.—A report sent out by James D. Hague, president of this company, states that good ore has been developed in the old North Star workings between the 1,100-ft. and 1,900-ft. levels which may prove to be a large vein.

Between January 1 and September 1 (the figures for August being partly estimated), there have been mined from this newly developed ore body 3,678 tons of ore, yielding about \$146,000, or nearly \$40 per ton, at a cost for all expenses of operation and development of \$40,000, or \$10.90 per ton, and giving an operating profit of \$106,000, or about \$29 per ton. The operating results of August have been considerably better, showing an output of 620 tons of ore, a product of about \$47,000, or over \$75 per ton, costs of about \$8,000, or \$13 per ton, and a profit of \$39,000, or over \$62 per ton. These results have been obtained in operating the 40-stamp mill at less than 1-3 capacity. Funds in hand on August 31 amounted to \$60,000, the present indebtedness for borrowed working capital amounts to \$60,000 and accrued interest. This indebtedness may be paid by sales of treasury stock.

(From Our Special Correspondent.)

Conlon.—Geo. A. Nihell has the contract for a new mill and hoisting works at this mine, at Grass Valley.

Gold Blossom.—A new company, represented by G. F. Dyer, of Mariposa, has taken hold of this mine at Grass Valley. The mine was formerly owned by Richard Jeffrey, but has never been worked on a large scale. Grading for a new hoist has begun.

North Bloomfield Mining Company.—This company at North Bloomfield, L. L. Myers superintendent, is constructing a flume to carry water to the Gaston Ridge, Plumbago, Union Blue Gravel and Malakoff mines for power. The flume is to be used while the ditches are being enlarged.

Puscheck.—This mine, at Chicago Park, owned by Dr. Puscheck, is to be unwatered. A 5-mile ditch has been dug from Bear River to carry 2,000 miner's inches of water. It will furnish power for a 15-stamp mill, compressors, etc.

Union Hill.—The pumps at this mine, at Grass Valley, E. C. Crellar superintendent, have started, and as soon as the 400-ft. shaft and drifts are drained, development will begin.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

J. Irving Crowell has sued Col. Thomas Ewing, president of the Southwest Miners' Association, for breach of contract in the purchase of a group of copper claims in Morrow District. Crowell avers that Col. Ewing was to pay him the sum of \$118,500 that the deeds were placed in escrow until payment of purchase price, and that Col. Ewing failed to fulfill the contract. Col. Ewing says he never agreed to buy the properties, but to pay a certain sum if he found a purchaser. The claims are copper properties at present undeveloped.

Eckas & Wilson.—These men have been some months working a 2-stamp mill on a claim on Old Baldy Mountains at a point over Ice House Canyon. The Huntington mill was packed in on burros.

Federal Mining Company.—This company will develop the Manvel Mine, at Manvel, from the estate of A. G. Campbell. A large mill is contemplated. Capt. C. H. Thompson, of Spokane, Wash., represented the Spokane purchasers.

Virginia Dale.—This mine, at Dale, has been bonded to Louis Wright, of Pomona.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

Bullion Bar Dredging Company.—The dredger of this company, at Potholes, 14 miles above Yuma, will shortly start up after a year's idleness.

Gold Rock.—It is understood that these mines, at Hedges, will resume operations about October 1, and preparations are under way to start the mill.

High Peak.—Ore is being hauled from this mine, at Julian, to the Helvetia Mill.

(From Our Special Correspondent.)

Iron King.—Work is suspended in this mine at Julian. A shaft will be sunk.

Oro Fino.—Mrs. Florence A. Stough has begun suit against Samuel M. Green, of Milwaukee, Wis., and others to recover certain money alleged to be due as payment on these mines at Escondido.

Poor Man's.—On this claim at Boulder Creek near Julian, E. Feeler and Geo. Moore are taking out some good rock.

Nobles Group.—Work has started on this group, near Julian, under W. E. McEwen superintendent.

SAN LUIS OBISPO COUNTY.

(From Our Special Correspondent.)

Quicksilver Mines.—Around Adelaida considerable work is being done. The Karl Mine is working 100 men and reducing 80 tons of ore daily. The tunnels and reduction works of the Alice and Modoc are being put in order by A. Johnson. Two sets of men are prospecting in 2 tunnels on the Eppinger property, at Josephine. Both the Libertad and Madrone mines have stopped work.

SANTA BARBARA COUNTY.

(From Our Special Correspondent.)

Western Union Oil Company.—This company operating in Carreaga District, has been lighting its plant, etc., for many months with natural gas. It now proposes to light the two towns of Lompoc and Santa Maria, being convinced that there is a good supply of gas for an indefinite time. The company is about to sink 10 more wells.

SHASTA COUNTY.

(From Our Special Correspondent.)

Crown Point.—W. F. Aram, M. E. Aram, C. H. Hatch and Nelson Waite have taken up 5,000 in. of water on Clear Creek, to be utilized for mining and electrical purposes in Centerville and Middletown Districts. The location has been made with a view to establishing a plant for working the Crown Point Mine, on Mule Mountain, owned by C. T. Hammond, of Oakland, and under bond to New York men represented by W. F. Aram, of Redding. The power plant will be on the Igo road, 10 miles from Redding.

McClure.—This mine, at Bully Hill, owned by the Mount Shasta Mining Company, F. E. Ware manager, is to be re-opened with a crew of 10 men.

Mountain Copper Company.—Large pumps are being installed at the Iron Mountain Mine to provide water for domestic purposes. The pumps are run by electricity, and will raise the water 1,000 ft. Manager Lewis T. Wright has gone to London for a few months, and W. L. Cole is acting manager.

Old Diggings District.—In the Texas, at Whitehouse, good ore is reported in the raise from the 200 to the 300 levels, and more men have been put on. The Keystone, adjoining the Texas, owned by E. White, has been bonded to Redding parties. The Lanyan and Ben Hart claims, 5 in all, are under bond.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Ironsides.—This property, near Yreka, has been purchased by E. D. Baker from Whipp & Loud, and men will be put to work at once.

McVey.—A Montana company is said to have purchased this copper mine, at Joe Creek, for \$300,000. A rail connection with the Southern Pacific will have to be made. The deposits of copper are said to be very extensive, though little development has been done.

Wabana.—In this mine, near Hornbrook, H. Mattern manager, a good force of men is busy. A 10-stamp mill is nearly ready.

TRINITY COUNTY.

(From Our Special Correspondent.)

Brown Bear Mining Company.—The main tunnel in this mine, at Deadwood, C. Dobler superintendent, is now in about 6,000 ft., and is still being driven. The west cross-cut is in 500 ft. Sixty men are employed.

Chloride-Bailey.—The mill at this mine, near Dedrick, is nearly completed. Twenty men are busy.

Dutton's Creek.—This hydraulic mine, near Douglas City, H. Lorenz manager, has closed after a successful run. The bank is 40 ft. high, and has averaged 22c. per cu. yd.

La Grange.—This hydraulic mine, near Weaver-ville, has about completed a successful season's work.

Misers' Chest.—This mine, near Dodge, has its Huntington mill ready to start.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Mount Hood Mining Company.—This property, at Jamestown, J. H. Burckhardt superintendent, is

owned by a San Jose company, which has 9 men busy. The 145-ft. shaft will be sunk 100 ft. further. Arrangements are being made for a 10-stamp mill.

Rawhide Gold Mining Company.—This company, owned by W. A. Nevills, has sued the Tuolumne County Water and Electric Company to restrain it from the continued use of a power plant, and to return the plant to the Rawhide Company. The complainants allege that the agreement stipulated that the power generated should be delivered to the Rawhide Company, and that they have not received all the power, but that some has been sold to outside parties.

Soulsby Consolidated Mill and Mining Company.—This is the new name of the company, in which Woods Bros. and Moore & Son, of Stockton, are largely interested. Hal. J. Sisty is no longer connected with the property. The mine is at Soulsbyville.

Water Supply.—A number of mines are temporarily closing down on account of the lack of water to generate electric power.

VENTURA COUNTY.

(From Our Special Correspondent.)

Big Chief Mining Company.—This company's claims are on Lockwood Creek near Griffin. A roller mill is being erected to be run by water power, also a hoist. G. B. Seibert is manager.

COLORADO.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—J. P. Miller to J. R. Miller, the Gilpin placer claim, Hawkeye District; B. J. Jones to A. M. Willard, et al., 1-3 interest in Boone, Wesley and Great Divide lodes, Wisconsin District; Ignass Gundy to the Lyons-Kyle Mining Company, westerly 581 ft. of Gundy lode, Quartz Valley District; James Flynn to C. W. Baldwin, tracts A, B, C, D and E and Flynn tract, Enterprise District; John A. McMahon to the Consolidated Investment Company, the Maine, Dig More, Oregon and Texas lodes, and Graham tunnel and tunnel site, Vermillion District.

Burroughs.—Denver and local parties have purchased the plant of machinery formerly on the Freedom Mine, and removed it to the property on Quartz Hill, where a new shafthouse, to be 30 by 60 ft., is to be built. W. Parenteau, of Central City, is in charge.

Carr Mine and Colorado Company, Limited.—Sinking has been resumed, and the 800-ft. shaft will be sunk to 1,000 ft. with Leyner air drills, about 3 ft. being made per day. About 70 men are at work, and the daily production is between 30 and 40 tons, the greater proportion being milling ores, treated at the company's mill at Black Hawk, the ores going over the new aerial tramway. Stephen Hoskin, of Central City, is manager.

Chlorination Tests.—Denver parties are making tests on Gilpin County ores, and it is believed that prospects are bright for a chlorination plant being erected in this county this year.

East Boston Mining Company.—Boston men are interested, and work is carried on by 12 men. The daily shipments average between 25 and 30 tons, most of which goes to the Randolph Mill at Black Hawk, besides a small quantity of fair smelting ores. Arrangements will soon be made to sink the 400-ft. shaft another lift of 100 ft.

Grand Central Mining Company.—Upon the return of Manager Dan McMasters from the East the shaft, now 400 ft down, will be sunk to 800 ft.

Helen Gold Mining and Tunnel Company.—This company has its tunnel in a distance of 160 ft., and will drive it a distance of over 2,000 ft. in the Pine District, and is figuring on erecting a stamp mill on the property in the future. They have cut one or two veins, the last giving assay values of from \$40 to \$110 per ton. Denver and Eastern parties are interested, with J. C. Heinz, secretary, at 50 Arapahoe street, Denver, Colo.

Powers Mining and Milling Company.—Chicago parties have become associated with local parties in a lease and option on this property in the Russell District, and are installing a 22-h.p. gasoline engine and complete plant, and repairing the shaft-house. The shaft is less than 300 ft. and they propose to sink it at least 200 ft. deeper. The property is well known for its production of enargite ores, which carry a heavy percentage of gray copper, the average of the ores taken out by local leasers being between \$40 and \$60 per ton. Frank Bright, Central City, Colo., has been placed in charge.

Sapp.—Central City men are interested in a lease on this property on Quartz Hill, owned by Hal. Sayer, of Denver, and are taking out a fair tonnage and making regular shipments to the sampling works, mills and Golden Smelter. Returns are more than satisfactory. A switch is being laid from the main working line of the Gilpin Tramway Company. B. M. Myers, of Central City, is manager.

Straub.—The machinery formerly used on the Great Mammoth Mine in Illinois-Central District has been moved to this mine on Gunnell Hill, leased and bonded by Ballantyne & Co. Operations will soon start under the management of W. Ballantyne, of Central City.

Sylvania Gold Mines Company.—A contract has been given to erect a building at the mouth of the tunnel property in Virginia Canon. Eastern and Denver parties are associated. The tunnel is started from the Clear Creek side, but is to cut the lodes in Gilpin County. L. A. Rice, of Russell Gulch, is in charge.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—The production remains about 2,000 tons daily of all classes of ore.

A. M. W.—Crude ore shipments are 150 tons daily. The Wolfstone pumps are holding the water between the 1,000 and 1,100-ft. levels.

Bertha.—Mr. Colley has a large siliceous ore body opened and has been shipping steadily, but has stopped work on account of a controversy over the title.

Cloud City Mining Company.—Operations, it is announced, will be resumed soon.

Columbia Placer.—After a satisfactory clean-up the property has closed for the winter. A lack of water caused considerable annoyance. Some of the gravel ran \$1.50 to \$2 a yard. Everything is in good shape for extensive work next season.

Evalyn Mining Company.—The shaft on the Evalyn is below the 1,000-ft. level, where drifts are being run after the ore caught at the 950 ft., and a large volume of water is successfully handled.

Hayden-Lima Placer Mining Company.—Preliminary work is completed, and the steam shovels are working successfully. In the general clean-ups a large amount of gray sand follows the gold. The material is lead ore and presumably comes from Two-Bit Gulch.

Ibex Mining Company.—A large amount of development is under way. Shipments are about 250 tons daily of oxidized and sulphide ores.

Morocco Mining Company.—T. S. Schlessinger has resumed work through the A.V. shaft.

President.—Messrs. Henry Gaw et al. have resumed work and are developing new ground.

Reno.—The management announces that in a drift from the 400-ft. level, 3 ft. of sulphide ore is now showing that assays \$50 and better. It is supposed to be the extension of the First National shoot.

Two Bit Gulch Mining Company.—In the Great Western, after many months of prospecting, copper sulphide and oxide ores, showing 4 ft. wide and assaying 30 per cent copper, with a good iron excess, have been found in a cross-cut from the new shaft at over 300 ft. The strike opens development in a virgin section.

Valley Leasing and Mining Company.—The surface plant at the new 175-ft. shaft is completed, and both the old and new shafts are in operation. Springfield, Mass., people are back of the enterprise.

PITKIN COUNTY.

Mollie Gibson.—It is reported that owing to the price of silver and the grade of ore found in the lower workings this mine at Aspen is to be abandoned. The pumps have been drawn. The mine was a famous producer of high-grade silver ore and has been opened to a depth of 1,300 ft.

SAN MIGUEL COUNTY.

(From Our Special Correspondent.)

Alta Mines Company.—The mill, which has been closed a month for repairs, has resumed operations. Its capacity has been considerably enlarged, and it is so arranged that if one set of rolls gets out of order an auxiliary set can be used. A. C. Koch is manager.

Blue Lake.—A rich strike is reported at this claim, in Bridal Veil Basin. While doing the annual assessment one of the owners cut a pay streak about 1 ft. wide, assays \$300 per ton, and the 4-ft. vein averages 102 oz. silver, .24 oz. gold and 7.7 per cent lead. Immediately after the strike 6 other neighboring claims were taken. A small bunk and boarding house will be erected. A few tons of the ore will be sent to the smelter for a test. The group is owned by Lewis White, Dan Blapp and two others.

During the 2 days' shut down, to celebrate Labor Day, the mills, compressors and hoists were thoroughly repaired, and all the machinery is in condition to run all winter.

Nelle.—The test mill run proved satisfactory. The mill is closed pending development work in the mine, but will start within a few days to run all winter. Cooper Anderson is manager.

Ophir-Consolidated Mining Company.—The mill at the Silver Bell Mine has not been started, as the shafting has not arrived. All the other machinery has

been installed. The plant has been idle since August 1. W. S. Buckley is manager.

SUMMIT COUNTY.

American Gold Dredging Company.—This company during 2 weeks handled an average of 2,300 cu. yd. of gravel per day at its plant, near Breckenridge.

French Gulch Placer Mining Company.—J. O. Whisler, superintendent, is putting the plant in thorough repair, and making extensive improvements for next season. The entire flume and pipe line system is being torn down and rebuilt. General Manager Benjamin F. Hall, Jr., Messrs. Garrett and Christy, heavy stockholders, have been on from New York City looking after the work.

Gold Pan.—This company, at Breckenridge, has conquered the heavy inflow of seepage water in its pit by installing a great centrifugal pump, throwing a 12-in. stream.

Howard.—This company, operating on North Star Mountain, 9 miles south of Kokomo, is getting in shape to ship. B. L. Turner, vice president, and J. F. Dervin, the secretary and treasurer of the company, have been at the mine for the past two weeks from Gardner.

Mountain Pride Company.—This company, at Breckenridge, is reported to have cut 5 ft. of high-grade lead-silver-gold ore. In August on a 22 days' run the mine shipped 159 tons of ore, and the mill produced about 3 carloads per week of concentrates.

Ohio Mines Company.—This company at Argentine, is pushing work on its new tunnel, now in over 400 ft. The company will erect a concentrating plant next spring.

Oro Grande.—This placer mine at Dillon is again going down after bedrock. Many delays, owing to cave-ins, scarcity of water, etc., have been encountered.

Robinson Smelter.—This plant at Kokomo will be ready about November 1 to resume operations.

Silver King.—This mine, at Montezuma, has the tunnel completed to the vein in the stope, and ore is uncovered ready for the concentrator, which will be running in a week.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

C. K. & N. Mining Company.—The officers have issued a statement which shows affairs to be in a very good condition. The company owns the Raaler claim adjoining the property of the El Paso Gold Mining Company. It is worked under a long time lease by Horace Granfield. The shaft has been sunk 300 ft. from which level considerable ore has been extracted. At present no work is done on this level, as the El Paso Company adjoining has temporarily suspended pumping. Ore is coming from the 225-ft. level. A royalty of 20 per cent is paid to the company. The first ore shipped was in January, and since then 1,533 tons of ore have been shipped, and the company has received \$12,589 in royalties. At present there are in the treasury \$11,844 and 68,100 shares of stock.

Doctor-Jack Pot.—Only 1 man is at present working in this mine, but quite a number of lessees are busy. Several are working through the Morning Glory shaft, where the company does the hoisting, charging a certain amount for it. Considerable ore is shipped by some of these lessees. On the old Davenport shaft 4 lessees are shipping a fair amount of ore. Some work is also being done on the old Smith shaft and the Riley shaft of the Elizabeth Cooper claim. The Morning Glory shaft is on the Morning Glory claim of the Work. Company at present under lease to the Morning Glory Leasing Company, controlled by the Woods Investment Company. The Woods Investment Company has also large holdings in the Doctor-Jack Pot Company.

Elkton Consolidated Gold Mining Company.—No work is being done on the lower levels, and no effort is made to keep out the water there. It is understood that when the new pumping plant is installed work on the lower levels will start again. About 30 men are working on company account. There are several lessees busy in the main workings, and in the Thompson claim. Lessees are also operating in the Tornado and other properties. Black and associates have a lease on the Raven dump, and have just begun operations.

Portland Gold Mining Company.—This company is at present shipping about 8,000 tons of ore per month. Its property on Battle Mountain is looking very well, and the new 300-ton mill at Colorado City is doing good work. The company owns about 180 acres of ground. J. F. Burns, of Colorado Springs, is president and general manager. J. R. Finlay, of Victor, is manager, and G. J. Garvin superintendent.

Shurtlof.—This property is producing some very good ore, and the best of it is said to come from the 700-ft. level. Grading is under way for a new compressor. The property is worked by a leasing company. It is situated on Ball Hill adjoining the Burns claim of the Acacia on the south.

Stratton's Independence, Limited.—The new manager, Thomas Cornish, of Cripple Creek, is in charge, and everything is going smoothly. A short time ago H. A. Shipman, who was manager, tendered his resignation. Mr. Grant, the assistant manager, also resigned, as did Mr. Loeb, the superintendent, and Mr. Glockner, the superintendent of the ore house. The mine is at present shipping considerable on company account, and several lessees are at work.

IDAHO.

BANNOCK COUNTY.

Intermountain Gold and Copper Mining Company.—This company, with a capital stock of \$500,000, has as its chief property the Lost Horse Mine on Pocatello Creek, near Pocatello. The incorporators are: C. K. Clark, E. G. Leaf, D. B. Mann, J. F. McCoy and Elizabeth Belcher, of Pocatello, and George B. Rogers, of Blackfoot.

BLAINE COUNTY.

Gold Creek Mining Company.—This company, a New Jersey organization, is erecting a cyanide plant on the Blaine group of claims of Moscow Mountain, formerly owned by D. Russell Morris, of Butte, Mont.

CUSTER COUNTY.

White Knob Copper Company.—According to a local paper a 5-days' trial run of one of the stacks at the company's smelter at Mackay showed a capacity of nearly 500 tons daily, though the supposed capacity was but 300 tons.

IDAHO COUNTY.

Big Buffalo.—The 10-stamp mill at this group of claims, near Hump, is steadily busy. The Buffalo Hump Company, which owns the property, is working about 25 men. E. S. Kinney is superintendent.

Blue Ribbon.—Patrick Clark, of Spokane, Wash., has taken a bond on this property near Elk City.

Crackerjack.—This property at Hump is reported to be treating 400 tons of ore monthly in its 5-stamp mill with good results. Five new stamps have been purchased. W. A. Stevens is manager.

Fall Creek Placer Company.—This company has 200 acres of placer ground 15 miles west of Florence and has begun work.

Jumbo.—This property, at Hump, is reported to have a good showing of ore. Monthly clean-ups of the 4-stamp mill are said to yield nearly \$5,000.

KOOTENAI COUNTY.

Idaho-Continental Mining Company.—This company, of which A. Klockman is managing director, will employ about 25 men at its galena property near Port Hill. It is said a 500-ton concentrator and a narrow gauge railroad, to connect with the Great Northern Railroad, will be built next spring.

SHOSHONE COUNTY.

Beaver Creek Gold Mining Company.—This company is reported building a dredge to work ground on Beaver Creek, above the holdings of the Northern Gold Mining Company, including the present site of Delta. The dredge may be finished this fall.

Delta Gold Mining Company.—This company controls about 150 acres of land in the bed of Beaver Creek, south of the holdings of the Northern Gold Mining Company. A dredge, under construction near Delta, is nearly finished.

Northern Gold Mining Company.—This company has its dredge at Delta ready for work. It cost \$40,000 and was put in by the Risdon Machine Company, of San Francisco, Cal. The boat is 75 ft. long and 35 ft. wide, will draw 4 ft. of water and will require a crew of 8 men. The machinery is expected to work to a depth of 30 ft. The company, of which C. S. Crysler is superintendent, controls about 200 acres of land in the bed of Beaver Creek.

Standard Gold Mining Company.—This company has placer ground on Pony Gulch, which empties into Beaver Creek. A contract has been let to clear a site for a hydraulic elevator, to be put in about 1,500 ft. from the mouth of the creek, where a pressure of 100 lbs. per sq. in. can be obtained. All the preliminary work will be done this fall and winter.

ILLINOIS.

Deeds to the lands which have been purchased, involving thousands of acres of coal, have been filed in the counties of Jackson, Franklin and Williamson. Thirty-one were filed in Jackson County, the consideration being more than \$100,000, conveying the property mostly to W. S. Foreman and in a few instances to Peter Jeffrey. The last named is general manager of the Consolidated Coal Company, while the former is the promoter of the syndicate. The whole body of land comprises more than 8,000 acres.

The deal in Williamson County was engineered by W. B. Lamaster, W. H. Warder and James Young. The Franklin County deal surrounds the great Leiter deal and is contiguous to that of the John W. Gates and Illinois Steel Company's purchase, which represents about 6,200 acres.

A railroad is now building from Fountain Bluffs, on the Mississippi River, to and through the land.

PERRY COUNTY.

Jupiter.—This new coal mine and 1,000 acres of fine coal land northwest of Duquoin have been purchased by the Weaver Coal and Coke Company of Chicago, the leading stockholder of which is John W. Gates. The consideration is understood to have been \$125,000.

INDIANA.

GREENE COUNTY.

(From Our Special Correspondent.)

Jefferson Coal and Mining Company.—This company, with headquarters in Linton, has incorporated, capital \$50,000. The directors are: A. A. Swartz, T. J. Lindley, G. H. Holzbog, A. T. Hert and E. C. Eaken. The company's coal land is in this county.

Panhandle Coal and Mining Company.—This company has incorporated with a capital stock of \$50,000 and headquarters at Linton. Coal mines will be worked in Greene and Sullivan counties. The directors are: J. Terhune, Charles Shively, F. D. Norton, H. C. Duncan and W. H. Watson.

KNOX COUNTY.

(From Our Special Correspondent.)

Prospect Hill.—All miners employed at these coal mines, near Vincennes, have been discharged and the shaft closed until the State mine inspector can investigate affairs. Recently a miner was dangerously burned by an explosion, alleged to have been caused by poor ventilation. The miners demanded that the ventilation be improved, and the company discharged the entire crew. About a year ago 300 miners came here from neighboring mines and after assaulting a number of miners ordered the mine closed until it was unionized. The union was perfected a few days later, and since that time the men and the company have had numerous disagreements.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Midland Portland Cement Company.—This company, recently organized, has begun erecting a large cement plant near Bedford. The mill will be of 2,000-bbl. capacity daily and will employ over 500 men. Cement plants of this county and of other counties in the State cannot manufacture cement fast enough to meet the demand.

KANSAS.

MARSHALL COUNTY.

Gypsum is reported found in Center Township, 10 miles southeast of Marysville and 4 miles from the nearest point on the St. Joseph & Grand Island Railroad. The property is owned by S. J. McKee, who intends to develop the deposit.

KENTUCKY.

PIKE COUNTY.

Blackberry Coal Company.—This company has increased its capital stock from \$1,200 to \$1,200,000. The company is organized for coal mining and oil seeking in the Kentucky mountains. Its property lies along Blackberry Creek. The incorporators are: John W. Remer, of Scarsdale, N. Y.; George S. Clay, of Plainfield, N. J.; Frederick M. Davies, of New York City, and Thomas Bogges, Jr., John F. Hager, and J. W. M. Stewart, of Ashland, Ky. The company has already begun business. Its chief offices will be at Ashland, Boyd County.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

S. D. North, of Hancock, Mich., has secured options on several pieces of land 2 miles west of the southern end of the Calumet & Hecla Mine. A limited amount of development shows a conglomerate lode of some value.

Arcadian.—At this mine the Douglass shaft has reached the 9th level. Drifting south has started.

Atlantic.—This company will experiment under ground with a Locke electric drill. Work in the cross-cut from the exploratory shaft on section 16 continues. Recently an amygdaloid lode was encountered.

Baltic.—A mass of copper, weighing 3,000 lbs., hoisted from the 7th level south of No. 3 shaft, is the largest ever encountered in the mine. The output averages 1,350 tons of rock per day, with 3 heads at the mill in commission. The 3d level, north from No. 5 shaft, is in good ground. South of No. 2 shaft the drifts are in good ground.

Calumet & Hecla.—Through the error of a hoisting engineer a cage at the Red Jacket shaft struck the top of the shaft-house and fell to the bottom of the shaft, a vertical distance of nearly a mile, with the cable. Some damage resulted, and hoisting was suspended for 48 hours.

Centennial.—Work is confined to sinking a shaft on the Kearsarge amygdaloid lode.

Champion.—This mine is producing 675 tons of rock daily, which is stamped at the Atlantic and Baltic mills. Eighty-four jigs of the Hodge eccentric pattern have been received at the stamp mill; 12 more of an improved type will be delivered from Hodge's foundry, Hancock, Mich.

Globe.—The Baltic lode has been encountered at a depth of 286 ft. with a diamond drill. It was fairly well mineralized.

Isle Royale.—This company's mill is running one head only. No. 2 is the only active shaft, and produces 500 tons of rock daily. Considerable mass and barrel copper is secured. A diamond drill on section 10 is searching for the Baltic lode. It is down 265 ft.

Old Colony.—This company is confining work to sinking a winze in a drift 50 ft. from the vertical shaft, 90 ft. deep. The winze is down 150 ft., on the dip of the lode.

Quincy.—This company will install an electric pump at the 8th level of No. 8 shaft on the Mesnard property, to handle the surface water.

Tamarack.—This company maintains a production of about 2,200 tons of rock daily, mainly from shafts 2, 3 and 5.

Trimountain.—The Wisconsin Bridge and Iron Works, of Milwaukee, Wis., has begun work on a new engine house at No. 3 shaft. No. 1 shaft is down 310 ft., No. 2 860 ft., and No. 3 800 ft. No. 4, a new shaft, is in the ledge 15 ft. at a depth of 145 ft.

Wolverine.—The new shaft house at No. 2 shaft will be ready for service in 3 weeks. Hoisting will be done by the plant at No. 3 shaft.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Ahmeck.—The road leading to this property has been repaired, and a hoist, compressor and boiler is being installed. One of the old test pits will be cleaned out and sunk and a cross-cut run to strike the Kearsarge lode.

Central.—This property is being thoroughly explored south from the old workings with a diamond drill. Work will continue until a cross-section is completed.

Mohawk.—This company has shipped 100 tons of Mohawkite to the Balbach Smelter, at Hackensack Meadows, N. J.

Phoenix.—The vein of copper recently encountered at the 500-ft. level of the West shaft is well mineralized. On the St. Clair fissure vein work is progressing.

ONTONAGON COUNTY.

(From Our Special Correspondent.)

Adventure.—This company has installed one head and equipment at the mill at Adventure Beach, and rock shipments have started. The second head will go in commission shortly.

Carp Lake.—This property, in the Porcupine Mountain District, is being examined by George E. Perkins, of Providence, R. I., who has had charge of work for the past 4 years; C. B. Gray, of Detroit, and Thomas Watson, of England. A report will be made to the stockholders, who will decide upon reopening the mine.

Mass Consolidated.—This company is sinking A, B and C shafts. Three hundred men are employed and 31 drills are used.

MINNESOTA.

(From Our Special Correspondent.)

Zenith Steamship Company.—This company has been formed at Duluth to build a 6,000-ton steel ship. Among its stockholders are several leading ore and steel men, already interested in the Duluth, Superior and Provident steamship companies. The report from Cleveland that a 550-ton steel ship, to cost \$45,000, was to be built for next year's business on the lakes was premature.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Franklin.—These mines, belonging to the Republic Iron and Steel Company, have shipped so far this year about 160,000 tons, of which the Union, belonging in half interests to the Republic and American Steel Hoop Companies, has about 85,000 tons. The new Pettit Mine at Bender, now flooded, has shipped less than 20,000 tons to the Republic Company, and will be able to do little more this year. A stock pile of 75,000 tons that has been lying at the Victoria shaft of the Republic Company for the last 3 or 4 years will probably be shipped.

Haskins.—At this new property, in 32. T. 57. R. 22, about 10,000 tons are in stock. Rails are laid within about 3 1/2 miles of the mine. The track will not be ready for some weeks, and the shipment this fall cannot exceed 20,000 tons. The stripping contract of 1,250,000 yds. is not yet let. Next year considerable ore will be taken from the stripped pit.

Hibbing Stockpiles.—The 200,000 tons in stock

north of Hibbing, at the Burt, Day and Sellers shafts, has been shipped, and the Great Hull Stockpile is nearly gone. The Pillsbury & Clark stocks are about shipped.

Kinney.—At this new property of the Republic Iron and Steel Company the contractors have been working very rapidly, and a large cut is already made. The mine will not be able to ship this year.

La Belle.—This new mine of the La Belle Iron Company, at Elba, has shipped so far about 30,000 tons and may produce 40,000 for the year. The company's stripping property near Mountain Iron has not been entered since the unfortunate attempt last spring. The cars and equipment are stored at Mountain Iron.

Pickands, Mather & Company.—This company's Utica Mine, west of Hibbing, will be shipping in a short time. The Troy Mine is now sinking about 80 ft. to the ore, and the shaft is expected to have considerable difficulty from quicksand.

St. Clair.—This mine, being opened by the Minnesota Iron Company, is owned in fee by the Oliver-Snyder interest. The Minnesota Company is working under an operating contract. The Shenango, owned and operated in the same way, is not likely to ship this year, on account of trouble from water and quicksand in sinking. The first shaft was practically abandoned some time ago.

Wills Mining Company.—A. W. Thompson, president of the Republic Iron and Steel Company; A. Maitland and E. D. Parmalee, officials of the same company, have formed the Wills Mining Company of Duluth, with \$150,000 capital, and have leased of Pettit & Robinson the east 1/2 of the northeast 1/4 of section 18, T. 58, R. 16, where they have a shaft down 110 ft. and are preparing to mine some ore this year. There may be 300,000 tons of ore on the land and on the McKinley townsite, adjoining to the east. The town will be moved to the northern part of the tract. The company may mine 10,000 tons this year.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

Iron Ore Shipments.—The Soudan hard ore mines have already shipped about as much as for all of 1901, and the Savoy, Sibley and Zenith have sent down some 350,000 tons. The early season estimates for this range were about 2,085,000 tons, and the mines are without exception well up to their allotments. Chandler is expected to ship 600,000 tons and has but 130,000 more to ship, while Pioneer has but 100,000 more to ship to fill its quota of 575,000 tons. The mine may exceed its allotment.

Minnesota Iron Company.—At the Soudan hard ore mines about 650 men are at work, and the output will be 700,000 tons. A good deal of this is the new grade "Soudan siliceous," running about 55 per cent in iron, better than 10 per cent in silica, and of bessemer quality. It comes from a pit at the western end of the property, where it is milled down to the 400-ft. level, trammed 800 ft., and hoisted through No. 8 shaft. The ore is 50 ft. wide and of 200 ft. long, and is known to be more than 300 ft. deep. The mine is now operated, where possible, on the caving system. The Montana workings are down 940 ft., with considerable ore there and below, the latter having been explored by diamond drills.

Oliver Iron Mining Company.—It is reported this company will do some diamond drilling midway between Tower and Ely, but no active preparations have been made. At the exploration conducted by A. M. Miller, Jr., just north of the Pioneer, one hole was sunk very deep and a second is under way. No other exploration work of importance is under way on that range in explorations except at the McComber, where drilling continues steadily.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—There seems a concerted effort among the buyers to reduce the price of ore, but only a few lots are being sold at lower figures than the week previous, the reduction being 50c. or \$1. The top price was \$38, the same as the week before. This price was paid for only one lot, that from the Carnegie Mine on the Dinkelbikler lease. The general top price for high-grade ores was \$37 per ton. The price on an assay basis was anywhere from \$33 to \$35 per ton for 60 per cent ore. Lead ore was in active demand at \$49 per ton, and another big shipment was made. The zinc production was light and was pretty well cleaned up. During the corresponding week of last year the zinc shipment was larger than last week by 465,720 lbs., the lead sales larger by 128,710 lbs., and the value less by \$43,155. During the corresponding 37 weeks of last year the zinc sales were less by 13,351,410 lbs., the lead sales greater by 465,720 lbs., and the total value less by \$1,171,908. Following are the sales from the various camps for the week ending September 13:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,609,420	330,780	\$52,229
Galena-Empire	1,271,840	267,350	25,627
Cartersville	3,026,160	396,230	42,126
Duenweg	1,206,180	157,620	24,367
Aurora	675,350	9,500	10,613
Carl Junction	436,830	.....	8,801
Granby	339,000	45,500	4,205
Neck-Alba	241,900	16,270	4,692
Prosperity	333,810	19,450	6,318
Oronogo	214,110	6,580	3,245
Zincite	213,790	.....	3,848
Cave Springs	115,040	12,600	2,150
Spurgeon	108,240	14,950	1,665
Central City	109,900	.....	1,538
Carthage	47,330	.....	905
Total	9,948,900	1,276,800	\$191,779
Total, 37 weeks	383,237,000	46,094,780	\$6,754,708
Zinc value, week, \$160,391; lead, \$31,388; zinc value, 37 weeks, \$5,735,316; lead, \$1,029,392.			

NEWTON COUNTY.

(From Our Special Correspondent.)

J. K. Crow and E. Evans have opened up a splendid face of ore in a shaft only 35 ft. deep in Newton County, south of Shoal Creek. They have a lease on 120 acres in an untried region and have put down 4 drill holes. Every one of the holes shows a 12-ft. face of zinc at a uniform depth of 35 ft. This is the first strike in that vicinity, and there is a rush of prospectors to the district.

Granby Mining and Smelting Company.—This company is preparing to make many improvements at the Mascot Mine at Granby. Three new shafts are being sunk and several hundred feet of tramway will connect them with the mill. The old ground is being opened up with steam drills, and the mill is being remodeled and enlarged. Preparations are being made to work over the immense tailing pile that has accumulated at this plant. The Mascot and Homestake mines of the Granby Company employ a large proportion of the Newton County miners.

MONTANA.

BROADWATER COUNTY.

(From Our Special Correspondent.)

East Pacific.—This property, near Winston, owned by R. A. Bell, of Helena, is under option to Eastern people. The mine has a record of more than \$500,000 in dividends from first-class ore shipped to the smelters. A large accumulation of second-class ore now on the dump awaiting a mill is estimated to have a value of \$200,000. A concentrating mill with a daily capacity of 50 tons will be erected in the near future. The mine is opened up by 4 tunnels, tunnel No. 4 being 2,800 ft. long and opening up the lead at about the 700-ft. depth.

FERGUS COUNTY.

Helsing & Lyons.—A 4-stamp mill at the head of Bed Rock Gulch is working satisfactory.

Kendall.—The mill at Kendall is crushing 300 tons of ore daily. The bulk of the ore comes from the west cut, which is now 75 ft. wide and 100 ft. deep. The new shaft is down 250 ft., where drifting goes on. The company's refinery is now ready for work. Iron pipe, to take the place of the wooden pipe in the ditch from Warm Springs, is arriving and will be laid before winter comes.

New Syndicate Sapphire Mines Company.—The hoist in place and work in the new shaft is about to start. A large force of men is busy and the season's work has been satisfactory.

GRANITE COUNTY.

Michigan & Montana Mining Company.—This company, of which J. H. Orfan is resident manager, has 5 men driving a tunnel on Stony Creek, 16 miles west of Phillipsburg. A strike of gold ore is reported.

Sunrise.—This mill and concentrator, near Phillipsburg, are in operation. About 10 men are busy at the concentrator, which is handling about 50 tons of ore daily. The ore comes from the Bunker Hill Mine, 1/2 mile from the mill, at the mouth of Henderson Canyon. All the claims in the district are reported practically controlled by the Henderson Mining Company, which succeeds the Sunrise Mining and Milling Company. About 50 men are employed. Chas. D. McLure is president, Frank D. Brown manager, and C. C. Spencer assistant superintendent.

JEFFERSON COUNTY.

Deer Lodge & Boston.—At these claims, near Basin, Superintendent Roberts has 6 men at work. The Deer Lodge shaft is being sunk.

Homestake & Silversmith.—These claims, 2 1/2 miles from Basin, are owned by M. O'Farrell and Jas. Higgins, but are under bond to D. Sweeney. A recent shipment of a car of ore netted \$113 per ton.

LEWIS & CLARKE COUNTY.

Montana Mining Company.—This company, of Marysville, has a crew of men developing the Strawberry Mine, near Bald Butte, recently bonded from Green Austin and others, of Marysville.

MADISON COUNTY.

Fairview.—Teal & Ribbet, of the General Shafter Mine at Summit have secured from John M. King,

a lease on the Fairview lode on the south side of Hungry Hollow, about $4\frac{1}{2}$ miles south of Virginia City. A vein of free-milling gold ore, 6 ft. wide and assaying \$35 per ton, is reported opened. Teal & Ribbet have 6 men at work.

SILVER BOW COUNTY.

Butte Miners' Union.—This body recently elected the following officers: William Haggerty, president; William McGrath, vice president; Dan Donovan, recording secretary; John Shea, financial secretary, and Nick Drummy, treasurer.

(From Our Special Correspondent.)

On the Lewis forty, in T. 55, R. 25, near the Mississippi River, a deposit of about 5,000,000 tons of ore have been found, but practically all is of a grade that is not suitable for the market.

Allice.—The shaft house and hoisting machinery, including the powerful Cornish pump, which were destroyed by fire a few days ago involving a loss of fully \$75,000, are to be replaced at once, Superintendent Buzzo having orders from the Walker Bros., of Salt Lake, who are the principal owners.

Climax.—This property, 20 miles southwest of Butte, near Ferley Station, is shipping to the Colorado Smelter ore carrying 126 oz. silver and \$10 in gold. Frank Bevis is working the property.

Gagnon.—This property at Butte is producing about 20,000 tons of ore monthly, a better record than ever in its history. The cost of production, counting all expenses charged up against the mine, is less than \$1.75 per ton, mined.

Montana Ore Purchasing Company.—This company lost its concentrator by fire August 28. A lease has been taken on the works of the Basin & Bay State Company, at the town of Basin, 30 miles from Butte, and a force of workmen is now placing the concentrator there in working shape. The capacity of this mill is supposed to be 500 tons each 24 hours. It will take some weeks to put the machinery in order. The company owning the works at Basin went into the hands of a receiver before the mill was finished.

NEVADA.

NYE COUNTY.

Butte-Tonopah Mining Company.—This company is to work 4 claims at Tonopah. The directors are: Lee Mantle, of Butte, Mont.; Dr. J. M. Merrill, of San Francisco; T. L. Oddie, general manager of the Tonopah Mining Company; Roger Dougherty, of Tonopah; D. J. McDonald, of Rosslund, B. C.; Dr. F. O. Chamberlain, of Bakersfield, Cal., and John Gerber, of Lincoln, Colo. Dr. J. M. Merrill is president, Dr. Chamberlain vice president and John Gerber treasurer. The secretary is W. C. Beattie. The headquarters will be in San Francisco.

NEW JERSEY.

SUSSEX COUNTY.

Allen Quarry.—This granite quarry, on the line of the Sussex Railroad, near Waterloo, has been leased by New York parties, who intend to work it on a large scale.

NEW MEXICO.

GRANT COUNTY.

Hanover Mining and Smelting Company.—This company has been organized, with office at Silver City, to operate mines near that place. The capital stock is \$500,000 in 50,000 shares of \$10 each. The directors are: William F. Leonuzze, Michael J. McEttrick, William B. Walton, Jesse O. Thomas and Frederick A. Bush.

LINCOLN COUNTY.

American Gold Mining Company.—This company and the Eagle Company composed of Chicago, Ill., men, are opening up claims at Nogal and Parsons, and the Old Abe and the South Somestake, at White Oaks. It also owns the Hewitt coal mine. The company is putting in a large stamp mill on the Helen Rae, and on the American Mine. It has now 10 stamps going night and day. The companies have men busy on development on the Parsons and in a few months the cyanide plant will be in operation. The 2 companies have bought up 88 claims, including the Old Abe and the South Homestake. A power plant will be put in near the Hewitt coal mine and power will be transmitted to White Oaks to light the city, and on to Nogal and the Nogal Mill on the Rae property and then to the Parsons group, some 9 miles distant. The stamp mills, pumps and hoists will all be driven by the plant at White Oaks. Eighteen miles will be the longest distance the electricity will have to be conveyed to the Parsons mills. The companies will start work on the Old Abe and the South Homestake in White Oaks in a few weeks and will sink the American to 500 ft. and connect it by tunnel with the Rae. The companies are working between 150 and 200 men and will increase the force. R. C. Steurgeon is vice-president.

SOCORRO COUNTY.

Los Angeles Chemical Company.—This company, capitalized at \$20,000 in \$1 shares, has been promoted

by Dr. S. M. Woodward, of Pasadena, Cal., to work guano or phosphate deposits near Lava.

NEW YORK.

ST. LAWRENCE COUNTY.

Union Talc Company.—This company of which O. J. David, of Gouverneur is superintendent, is preparing to open a talc mill with a capacity of 100 tons daily. Electric power will be used. The company owns the American, Columbia and Wright talc mines, the American, Columbia and Kellar talc mills and the Kellar wood pulp mill. The company proposes to connect its plants by a trolley line.

PENNSYLVANIA.

ANTHRACITE COAL.

Coal Miners' Strike.—The operators are making steady, if slow, gains in resuming work at washeries and mines, and the output of coal is increasing. The officials of the United Mine Workers, though professing satisfaction with the outlook, realize that their position is becoming desperate, and that unless they can hold the men in line a break will come that will end the strike quickly. It is not improbable that the next week will see considerable rioting and possibly some bloodshed, as the miners slowly realize how they have been led astray by these officials. Twenty collieries and 29 washeries are reported in operation in the whole anthracite region, and the estimated production is about 28,000 tons daily. The companies reported working one or more collieries or mines are: Delaware, Lackawanna & Western Company, New York, Ontario & Western Company, Erie Railroad Company, Delaware & Hudson Company, Lehigh Coal and Navigation Company, Lehigh Valley Coal Company, Philadelphia & Reading Company, Smith & Myers Company, Temple Coal and Iron Company, Lehigh & Wilkes-Barre Company, North American Coal Company, Susquehanna Coal Company, Warnke Brothers, People's Coal Company, Beddall Brothers, St. Clair Coal Company, Pardee & Co., Sterling Coal Company.

Clarence Coal Company.—This company, of Scranton, has taken possession of the Westminster tract of coal land back of Yatesville. The property has been partially worked by Miner & Co. The capital of the new company is \$200,000. Among those interested in it are: Clarence B. Sturges, Walter Schlager, Frank Schlager, T. F. Wells and Frank B. Sturges.

BITUMINOUS COAL.

Keystone Coal Company.—Dr. J. B. Keaggy, of Allegheny, has sold to this company a body of coal containing 310 acres near Greensburg. The consideration was \$90,000. Ten acres of surface were included.

SOUTH DAKOTA.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Gladiator Gold Mining Company.—A 60-ft. vein is reported on the Murray group of claims, along Deadwood Gulch. Tests are being made on the ore for the purpose of ascertaining by what process it may be treated.

Glover Gold Mining Company.—It has been decided to sink the 370-ft. shaft to 500 ft. The horse whim is to be replaced by a steam hoist.

Golden Crest Mining Company.—James Hartgering has the contract to build the 10-stamp cyanide mill at the mine. It will be running by January 1. The company has recently put in 2 whims, and sinking incline shafts. It is the intention to ultimately connect the inclines with the main shaft, which is 300 ft. deep and is equipped with a steam hoist.

Golden Treasure Mining Company.—This company is capitalized at \$1,500,000, has been organized to develop 42 acres of mining ground in the siliceous ore measures of Bald Mountain. W. H. Brooks, of Omaha, Neb., is president; C. M. Harris, of Edgerton, O., vice-president; Hiram Long, Edgerton, O., secretary; J. F. Mast, Edgerton, O., treasurer; Eli P. Farnham, Central City, superintendent. The other director is O. E. Farnham, of Deadwood. Titus Corkhill, ex-State mine inspector, is consulting engineer. The company has started a shaft, intending to sink to quartzite.

Horseshoe Mining Company.—Work has begun on the 1,000-ton stamp-crushing cyanide plant at the Mogul Mine in Ruby Basin. The Allis-Chalmers Company, of Chicago, has the contract to furnish the machinery, and the plant is required to be ready by January 18, 1903. It will occupy 2 buildings, one of which, 70 by 75 ft., will contain 2 Gates No. 6 crushers and coal bins. The pulverizing will be done by 120 stamps, each weighing 1,000 lbs., arranged in two sections of 60 each, with 100 ft. interval between sections, the interval to which will be occupied by the power plant. The stamps and 46 tanks will occupy a building 150 by 500 ft. Ore will be carried from the crushers to the stamps by a belt con-

veyor 610 ft. long. The buildings will stand 150 ft. apart, and the conveyor will extend the entire length of the stamp building, with unloaders over the batteries. Motors will be of the double discharge type, to minimize slimes. Power will be furnished by 500-h.p. Allis Corliss engine, connected with the stamps by belts. This engine will also run a 250-h.p. electric generator. All other machinery will be driven by electric power. There will be 6 standard tubular boilers. The ore will be delivered at the crusher bins by aerial tramway, which will be extended to the different mines of the company.

Manila Mining Company.—A steam hoist and pumps have been ordered for the shaft on Elk Creek. Work has temporarily stopped.

Pluma Mining Company.—The mining ground and improvements of the Hawkeye Mining Company have been purchased. There are 41 acres, including 9 acres in millsite at Pluma Station on the Burlington Railroad, on which the Hawkeye 40-stamp mill stands. The Pluma Company will add 40 stamps and a cyanide annex, and prepare for milling ore from both the Pluma and Hawkeye mines. The two properties are adjoining and are both surrounded by Homestake ground. They are connected with the stamp mill by cable tramway 4,600 ft. long. Developments are now under way on the siliceous ore bodies.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Benedict Group.—A Montana syndicate, represented by Percy Train, of Butte, has taken the option formerly held by the Black Hills Mining Company, and is preparing for prospecting. The Black Hills Copper Company took its bond last March and installed a Chilean quartz mill, which was run several months on ore from an incline shaft.

Black Hills Copper Company.—The west cross-cut from the bottom of the 800-ft. incline shaft is in 110 ft. The ledge was cross-cut at the 400-ft. level.

Copper Mountain Mining Company.—A smelter of 100 tons capacity is under consideration for the property near Hill City. The company has developed a large body of copper ore. John Good is foreman. The company was organized by S. A. Baxter, of Lima, O.

Cumberland Mining Company.—A station has been established at the 200-ft. level in the J. R. Shaft, and drifting is under way.

Lakotah Mining Company.—The Grizzly Bear Mine has been reopened, the 10-stamp mill repaired and connected with the mine by cable tramway, and ore is being taken out. The company has been recently organized by Denver and Pennsylvania men. John Truax, of Hill City, is foreman.

National Smelter.—The Horseshoe Mining Company has taken possession of the 500-ton plant at Rapid City and intends to start it some time this month. The transaction amounted to an exchange of stock, stockholders in the National Smelting Company receiving shares in the Horseshoe Mining Company at the par value of \$1 each.

Sunbeam Mining Company.—The air compressor, drills, hoist and pump purchased of the Wabash Mining Company have been installed on Friday Gulch. The shaft is 150 ft. deep, and the gold ore vein at that point is reported 12 ft. wide.

TEXAS.

GALVESTON ISLAND.

(From Our Special Correspondent.)

Atlantic & Pacific Company.—The well is down 760 ft. Sand was encountered for 600 ft., then shale and slate. The drillers state that they passed through a strata which had a good showing of oil, but that they did not look for oil in any quantity before reaching 900 to 1,000 ft.

HARDIN COUNTY.

(From Our Special Correspondent.)

Sour Lake Springs Oil Field.—The Sour Lake Oil Company struck a good flow of oil at 361 ft. The drillers did not expect so much gas and oil at such a shallow depth, and were unprepared to control the well. It got away from them, and so much damage resulted that it may have to be abandoned.

JEFFERSON COUNTY.

Beaumont Oil Field.—A fire was started in the northeastern part of the oil field where the derricks are thick on September 12. The blaze swept over about an acre in the Keith-Ward tract, completely wiping out everything combustible and leaving the burnt ends of the well casings sticking above ground. There were probably 25 wells in the burned section, and of these only 2 were gushers. The fire started by a man carrying a lighted lantern into a fuel tank to gauge the amount of oil in it. A 37,500 bbl. steel tank full of oil belonging to the Higgins Oil and Fuel Company, 300 yds. away, caught fire, but much of the oil was drawn off. A setting tank, nearby, holding 1,500 bbls., also burned. The Brice Company losses

are reported heaviest, amounting to about \$32,000. Some 20 other companies and individuals will lose a total of about \$35,000 in property destroyed, not counting oil and loss on contracts, etc.

(From Our Special Correspondent.)

Beaumont Oil Field.—Prices for crude are a little stiffer. Unless other strikes are made in Texas or Louisiana very shortly the selling price of crude will be based on what refineries can pay, and not on a fuel oil basis. The tendency to make changes from coal to fuel oil burners has received a marked check on account of irregular shipments to present users and the inability of consumers to obtain satisfactory contracts for future delivery. In spite of all denials an increasing number of wells are pumping a varying proportion of water. Bad drilling, surface seepage, etc., are advanced as causes, but the water is gradually but surely rising in all the deeper wells in portions of the field. The J. M. Guffy Petroleum Company is drilling 2 more wells in the McFadden and Gladys tracts.

Export Oil and Pipe Line Company.—This company, which has a 7,500-bbl. daily contract with the Central Asphalt and Refining Company, has purchased 10 wells from the Hogg-Swayne Syndicate and will equip them immediately for pumping. The company now claims to own 12 wells and expects to be able to supply the contracted quantity of oil.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlements.—The Salt Lake banks report the following settlements during the week ending September 13: Bullion, \$74,000; gold bars, \$15,900; gold, silver, lead and copper ores, \$230,900; auro-cyanide, \$8,600; total for week, \$329,400.

BEAVER COUNTY.

Majestic Company.—Rapid progress is reported on the preliminary work at the company's smelter site, $2\frac{1}{2}$ miles southwest of Milford. The new boarding and lodging houses have been completed. The construction of the pipe-line trench between the smelter and town-site will soon begin, and the laying of pipe will follow. The new town will be called Lewisville, after A. B. Lewis, president of the company.

Roland Mining Company.—This company has been incorporated to develop a group of 7 claims adjoining the Horn Silver property at Frisco. The capital is \$1,000,000. The incorporators are D. P. Rohlfing, superintendent of the Horn Silver Mine; James Sharp, R. C. Druessedow, of Omaha, Neb.; A. Kindall, of Onawa, Ia., and W. H. Tibbals. The last named will be president. D. P. Rohlfing will be treasurer and manager, R. C. Druessedow, vice president and E. J. Waugh, secretary.

(From Our Special Correspondent.)

Cactus Company.—Reports from the property state that the "lost channel" has been found again. This was the channel that gave the property its first history as a high-grade proposition. A valuation of \$2,100 was once obtained, and now it is stated that Mr. Newhouse's forces have cut into this channel between the 100 and 200-ft. level, and samples show over 800 oz. silver, \$21 in gold and 15 per cent copper.

Horn Silver Company.—This mine sent to the samplers 2 cars of ore from Frisco for the week ending September 13.

Majestic.—The underground forces have been doubled in the O. K. group and other groups, and the foundations of the smelter just out of Milford are finished. It is stated also that the Oregon Short Line Railroad will connect the group with spurs leading to the smelter, and that surveyors are now on the ground.

JUAB COUNTY.

Centennial-Eureka.—Ore is going over the tramway to the railroad after a year's idleness. About 70 men are employed under Superintendent Brown. The mine is expected to turn out 200 tons of ore every day of 10 hours. In the long drifts that connect the shaft with the vein 10 mules will be used to haul the ore from the 4th, 5th, 6th, 7th and 10th levels. The contents of the cars will go direct to the ore buckets, from which they will be delivered into the self-dumping steel railway cars, of which the United States Company has provided 20. Everything in the mine with a value of \$10 or over will be shipped, the ore to be graded in 3 classes—No. 0, which is the first-class copper; No. 00, the second class, and an extra, which will include all ores not containing copper. Practically all the ore will be broken with machine drills, and nearly all the miners working in ore will be paid by the ton. Under this system it is estimated that it will cost in the neighborhood of \$1.85 per ton to break and load the ore on the railroad cars.

Lower Mammoth.—Good ore, of the grade found below the 500-ft. level, is reported cut on the 600-ft. level. A recent shipment of 2 cars gave returns of 106 oz. silver, with a little gold and copper.

(From Our Special Correspondent.)

Tintic Shipments.—The Taylor & Brunton Sampler reports the following receipts for the week closing September 13: Mammoth, 17 cars ore; Grand Central, 5 cars ore; Eagle & Blue Bell, 2 cars ore; Gemini, 11 cars ore; Carisa, 4 cars ore; South Swansea, 2 cars. The Conklin Sampler reports: Victor, 2 cars; Lower Mammoth, 2 cars; Iron Spur, 1 car ore.

Carisa.—It is stated this company has a contract with the Sioux-Utah Company to open its ground through the big tunnel of the latter. This arrangement will cut down operating expenses materially.

Mammoth.—This company has 20 tons of rich ore on the market from different parts of the mine, sacked as taken out. The assays average 288 oz. silver and \$336 gold per ton.

South Swansea.—This property has closed down, with no cause given out. It is supposed to be closed in connection with the option that is out on the Swansea.

Uncle Sam.—The plan to build a concentrating mill has been abandoned, and instead the company will probably treat its ores at the Tesora plant. The reason for giving up building was an uncertain supply of water.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—For the week ending September 13 the output outside of the large concerns doing their own smelting was: Dalton & Lark, 2 cars ore; Ben Butler, 7 cars ore; Moscow, 1 car ore; Shawmut, 4 cars ore; Bingham Copper and Gold, 3 cars ore; Honest Abe, 1 car ore; Petro, 1 car ore; Storey, 3 cars ore; New England, 1 car ore; Phillips Lease, Boston Consolidated, 1 car ore; Maxfield, of Big Cottonwood, 2 cars ore; Flagstaff, of Alta, 1 car ore.

Utah Consolidated.—The output of copper bullion from the Highland Boy Smelter for the week ending September 13 amounted to 5 cars, or 300,000 lbs., and was shipped to the refinery in New Jersey.

SUMMIT COUNTY.

West Ontario.—The old 400-ft. shaft at Park City has been retimbered to the 350-ft. mark and the drift at that depth is partially opened. There is still nearly 50 ft. of the shaft to clean out and retimber.

(From Our Special Correspondent.)

Park City Shipments.—The Macintosh Sampler reports these consignments: Daly West, 3,183,040 lbs.; Ontario, 977,740 lbs.; Anchor, 414,640 lbs.; all for the week ending September 13.

Silver Key and Keystone.—These two corporations, each capitalized at 200,000 shares, have been purchased by local and Eastern capital. The price paid is not given out. The ground of both companies will be transferred to a new corporation organized under the Wyoming laws with a capital of 400,000 shares. A provision has been made to exchange share for share with any holder of the two above properties. The 12 patented claims immediately adjoin the Keith-Kearns Company's property on the south and southwest, and are flanked on the east by the Daly-Judge and West Ontario.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—The Ophir Hill reports 31 cars of lead-silver concentrates, and the Hidden Treasure of Dry Canyon 4 cars ore for the week closing September 13.

Fish Springs Shipments.—The Galena sent in 1 car of ore for the week, and the Utah 1.

WASHINGTON.

FERRY COUNTY.

(From Our Special Correspondent.)

Black Tail.—Everything about the tunnel has been put in repair. A trestle has been built across the Eureka Gulch to the Republic & Kettle River Railway track.

California.—Regular shipment of ore continues. A contract has been let to sink 100 ft. below the 400-ft. level. Out of 52 men, 25 have been laid off, on account of ore being mined faster than it can be hauled to the railroad with present facilities.

Little Ruby Placer.—Wisconsin men have an option on this claim, near Republic, it is said, for \$5,000.

Lucille Dreyfus.—The Washington & Great Northern Railway Company is starting the building of a 1,000-ft. tramway to this mine, on Mineral Hill, near Nelson. It will rise to an elevation of about 500 ft. and will reach all the mines on Mineral Hill.

Mineral Hill.—This mine has about 2,000 tons of ore blocked out. A large force of men has started to break it down and get it ready for shipment.

North San Poil.—About 100 tons of ore have been shipped from Republic to the Granby Smelter.

Princess Maud.—This mine is closed until a regular market can be found for the ore. About 100 tons have

been shipped to the Granby Smelter, at Grand Forks, B. C.

San Poil.—The company is shipping 200 tons of ore to the Granby Smelter, at Grand Forks, B. C.

Silver Dollar.—The shaft is down 180 ft.

Tom Thumb.—The miners have been discharged, and the mine closed to await such time as the company can ship 1,000 tons of ore monthly, which the management claims to be only one-third of the producing capacity of the mine.

Trade Dollar.—Four men have been laid off and the work reduced from 3 to 2 shifts. Drifts are being driven on the vein on the 300-ft. level. In the north drift the vein is from 5 to 7 ft. wide, and in the south it is about 4 ft. wide.

OKANOGAN COUNTY.

(From Our Special Correspondent.)

Grant Group.—W. T. Mendenhall, of Minneapolis, Minn., has bonded this property at Chesaw for \$40,000, it is said, and has started miners working. The values are principally in gold and copper.

Old Germany.—The tunnel, in over 300 ft., is to be carried in to the vein.

Oregon.—Buildings are being erected for winter-quarters at Chesaw.

Rainbow.—Milwaukee people are said to have bought for \$5,000 this claim at Chesaw.

SNOHOMISH COUNTY.

Monte Cristo.—The men employed at the concentrator at Monte Cristo are reported on strike, demanding \$4 for 12 hours' work, or \$3.50 for 10 hours, instead of \$3.50 for 12 hours, the wages now paid.

WEST VIRGINIA.

Coal Miners' Strike.—The report that the miners in the New River field returned to work in a body on September 8 is denied. The mines in that field are increasing their output daily, and are working about half the regular force. Miners are being forced out of the company houses every day, and as the weather gets colder they must either move away or go back to work. A committee of New River coal operators has adopted resolutions declaring that the operators will not recognize the United Mine Workers of America or treat with it or any of its members, with reference to the wage-scale or other conditions of employment, and will make no concessions or in any way change the conditions of employment from what they were prior to June 7, when the strike was called.

BARBOUR COUNTY.

Monongahela Bituminous Coal Company.—This company has 50 men opening a new coal-field at Volga, near Century, on the Century branch of the Baltimore & Ohio Railroad. This tract is composed of 2,500 acres. Underlying it are both the Freeport and Pittsburg veins. Sam. H. Gramm is president of this company, and W. S. Schrader vice president and general manager. The head offices of the company will be at Grafton. The latest and most approved mining machinery will be placed in the new field, and a tippel and 50 houses erected at once. Mr. Schrader, the general manager, is also general manager for the Tygart's Valley Coal Company, with general offices at Grafton.

MCDOWELL COUNTY.

Big Four.—An explosion of gas at this mine, of the Algoma Coal and Coke Company, at North Fork on September 15 resulted in the death of 17 miners, 16 of whom were negroes. The explosion was caused by the naked lamp of a miner setting fire to an accumulation of gas. This in turn fired 6 kegs of blasting powder, which the miners had taken into the mine. The explosion knocked down brattice for a quarter of a mile, and set fire to the workings.

TAYLOR COUNTY.

James W. Hair is reported taking up coal land near the Preston County line. The tract consists of 6,000 acres, and the price being paid is \$12 an acre, or \$72,000 in all. The land is being purchased for James M. Guffey, of Pittsburg, Pa. Mr. Hair altogether has taken up 40,000 acres and has 25,000 more under option.

WISCONSIN.

IRON—MENOMINEE RANGE.

Florence.—This mine is expected to ship 100,000 tons of ore this year from Florence. Work on the new No. 4 shaft is progressing slowly. Many surface improvements are underway. A system of underground haulage may be installed. Felix Vogel is general manager.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

Transvaal Gold Mining Estates, Limited.—The general manager, Mr. H. Hughes, after inspecting the

company's property, has made a full report, of which the following is a summary, issued under date of August 28, 1902. The report is of interest as indicating the general condition of the mines after the war:

"All things considered, the property has suffered less than might have been expected, and although a certain amount of damage has been done to the electric plant, wood fixtures and timber, and tools and stores have been removed, the extent of the company's loss may be gauged by the fact that the plant has suffered more from standing idle and the lack of the usual attention, than from any wilful destruction by the Boers. As constant attention to timbering was always necessary in certain of the mines, and that attention could not be given during the war, a good deal of caving in has taken place. The damage, however, is not so bad as was anticipated, and by hard work things should soon be restored to their old condition. For the present the question of transport for stores and material is most urgent, and a supply is being arranged. Both the Central Mill and Kameel's Creek Mill are in perfect condition, except that the belting has been removed, and some of the plates damaged by scraping. A few of the buildings and workmen's quarters received some damage from a violent storm in 1901, and, as they had been occupied by the Boers for some time, a good many repairs will be necessary. The Clewer Mine, however, is in such excellent order that, were supplies available, 40 stamps could be started at once. A few minor repairs will put this mine in thorough working condition. The water races need attention, as some damage was done by heavy floods. The bridges also need repair. The electrical machinery at the various power stations has sustained but little damage, except that at the Clewer generator the Boers removed the winding from the armature and the rope for power transmission. The electric locomotives will need thorough overhauling. With regard to the cyanide and slimes plants, some of the supports and woodwork need repair, but the boxes, lathes, motors, etc., are all perfect, and only want overhauling and cleaning up. The various tramways appear to be in good order, but the trucks have been considerably damaged.

"All the company's books, documents, plans and safes were found intact in the strong room, which adjoined the room in which the Boers actually printed their 'blue-backs.' A parcel of lead bullion (value about £17,000), which was packed away in cyanide cases, remained untouched. No great difficulties stand in the way of bringing the mines and works back to their normal condition. Permission has been granted by the Mining Department to start mining operations, which will proceed simultaneously with the overhauling of the plant."

AUSTRALIA.

WESTERN AUSTRALIA.

The gold output for August is reported at 187,972 oz. crude. This brings the total for the 8 months ending August 31 to 1,407,935 oz. crude, against 1,180,180 oz. for the corresponding period in 1901; an increase of 227,755 oz., or 19.3 per cent. The total this year was equal to 1,214,785 oz. fine gold, or \$25,009,602.

CANADA.

BRITISH COLUMBIA—BOUNDARY DISTRICT.

Boundary Ore Shipments.—Shipments for the week ending September 6 were: Granby mines, 4,978 tons; Mother Lode, 2,176; Snowshoe, 480; B. C. Mine, 300; Emma Mine, 130; total for the week, 8,064; total for the year to date, 306,471 tons. This Granby Smelter treated 5,022 tons during the week, making a total for the year to date of 200,189 tons.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rossland Ore Output.—The output for the week ending September 6, says the Rossland Miner, was curtailed by the labor holiday. The War Eagle and Centre Star mines have raised their tonnage to a figure approximating their standard output under the new shipping arrangement with the Trail Smelter. Additional men have been put at work on the Nickel Plate and Kootenay mines. The output was:

Table with 3 columns: Name, Week, Year. Rows include Le Roi No. 2, Centre Star, War Eagle, Great Western, Giant, Cascade, Columbia-Kootenay, Bonanza, Velvet, Sphree, White Bear, and Totals.

MEXICO.

SONORA.

Arizona-Mexico Copper Company.—This company has been incorporated under both American and Mexican laws, with a capital of \$3,000,000 gold, to exploit the Grand Province Dora de Cobra Mine, con-

sisting of 20 pertenencias, situated at Caboetia. The president of the company is J. B. Hutinger, of New Haven, Conn.

ZACATECAS.

(From Our Special Correspondent.)

Douglas Brown and W. S. Gage, two American mining engineers, are erecting a large cyanide plant and electric transmission equipment at Zacatecas, where they have opened a large deposit of gold ore that yields \$6 to \$9 per ton. This enterprise is giving great motion to this rich silver camp which has paid so little attention to its low grade gold ores.

NEW CALEDONIA.

Exports of ores from New Caledonia for the 6 months ending June 30 are reported by the Bulletin du Commerce of Noumea as below, in metric tons:

Table with 4 columns: Ore type, 1901, 1902, Changes. Rows include Nickel ore, Cobalt ore, and Chrome ore.

Some preparations are being made for the erection of a plant for the electrolytic refining of metals at Tao, where a large water-power can be utilized.

It is stated that development work will soon be begun in the coal basin of Nondone. Little work has heretofore been done there on account of the difficulty of securing labor.

NEW ZEALAND.

(From Our Special Correspondent.)

Hauraki Gold-field.—The chief returns during June were: Waihi, £34,446 (\$172,230), from 12,004 tons; N. Z. Crown, £7,105 (\$35,525), from 2,802 tons; Waitakauri, £4,363 (\$21,815), from 2,986 tons; Komata Reefs, £2,400 (\$12,000), from 930 tons; Mananu, £1,400 (\$7,000), from 540 tons. The Waihi Company's report, though quite satisfactory, shows a falling off of nearly £6,000 as compared with the yields of the preceding 3 or 4 months, caused by the lower grade ore treated, but compares favorably with last year's monthly yields, and represents a return to normal conditions, following the working out of an exceptionally rich block.

The 40-stamp battery, lately the property of the Union-Waihi Company, which has now been absorbed by the Waihi Company, is being repaired and altered to suit the Waihi ore. It is expected to start milling in about 2 months.

In the Waihi Extended Mine, which adjoins the Waihi and Grand Junction properties, driving has commenced from the bottom of the shaft, which was lately sunk to the 500-ft. level. A good class of country is being penetrated.

Phosphate Rock.—The discovery of phosphate rock some 30 miles southwest of Dunedin, has caused much local excitement. Samples sent to the Government laboratory have given good assays.

SOUTH AMERICA.

BRITISH GUIANA.

The Mines Department reports the production of gold in July, on which royalty was paid, at 7,787 oz., against 9,445 oz. in July, 1901; a decrease of 1,658 oz.

Massaruni Diamond Mines, Limited.—This company has been formed in London with a capital of £10,000 in £1 shares, to take over 45 claims owned by the Lucky Jim Syndicate in the Massaruni. The new company, all the shares in which have already been taken up, is not connected with any other syndicate now operating in the colony.

MINING STOCKS.

(Complete quotations will be found on pages 396 and 397.)

New York.

Sept. 19.

The improvement in the statistical position of the metal is reflected in the copper share market. So far fluctuations are not significant, being fractional, though on the day's trading show a margin of over 1 point. On Monday Amalgamated sold at \$68 @ \$68 3/4 on moderate trading, and on Tuesday, after receding to \$67 3/4, gradually recovered to \$69 1/4, which established the high and low water mark for the week. Anaconda softened from 107 1/2 per cent (\$26.78 1/2) to 106 1/4 per cent (\$26.68 1/4) on Monday, and on Tuesday and Wednesday absolutely nothing was done in the stock. On curb investment orders were few, and trading was centered in a small group of specialties that have friends among the brokers. Greene Consolidated, of Mexico, changed hands at \$28 @ \$27 3/4, Tennessee at \$17, White Knob of Idaho at \$18 1/2—the lowest in some time—British Columbia \$5 1/4 and Montreal & Boston \$3 3/4 @ \$3 1/2.

American Smelting and Refining showed transactions in a few hundred share lots, the common stock selling fractionally above \$46 and the preferred above \$96. Dividend No. 13 of 1 1/4 per cent quarterly on

the preferred stock has just been declared payable October 7. This amounts to \$875,000, and brings the total since incorporation to \$8,891,553 on the preferred capital. No dividend has yet been declared on the common stock. At the annual meeting this week the old officers were re-elected.

Homestake, of South Dakota, has passed its extra dividend of 25c., and will pay only the regular monthly of 25c. This is the first time in a long while that only 25c. has been declared, the reason being heavy expenditures for the control of the Caledonia, Deadwood Terra, Father de Smet and other properties, and for making important improvements and additions such as a new cyanide plant, etc., in the Homestake territory. In the 9 months ending September 25 the company will have paid in dividends \$4.50 per share, or \$894,600. Since incorporation the company has paid \$11,584,350, the bulk of which has been distributed to the holders of the old capital stock. This week 30 shares were sold at \$78 per share, and 50 shares at \$75, which compare with \$90 received April 17 last, and \$99 on February 7, which was the highest point this year.

Alice, of Montana, continues to fall in value, and this week sold at 25c., which is the lowest price in a long while. The destruction by fire of the company's plant is partly responsible for this decline. In fact no dividend has been declared in nearly 5 years.

A sale of Quicksilver common of California is noted at \$3.35.

In the Cripple Creek, Colo., section the situation looks clearer since Western brokers are reviving the market. Portland, in anticipation of an early resumption of dividend payments, stiffened to \$1.97. Heretofore the company paid quarterly dividends of 6c. per share, or \$180,000, but since January no declarations have been made. It is interesting to remark that Portland has paid over 140 per cent on its \$3,000,000 capital stock. Isabella looks better, though trading is still uncertain around 34c., as there has already been too much manipulation in the stock.

In the Comstock list a few stocks still keep in view, though the movement in prices is uninteresting. Consolidated California & Virginia holds at \$1.25, just as Ophir does. Hale & Norcross appeared at 30c., and Potosi at 20c. Seven companies are collecting assessments aggregating \$48,880, being at the rate of 3c. to 10c. per share.

Auction sales were 21 shares Roane Iron Company at \$62, and 300 preferred shares Joseph Ladue Gold Mining and Development Company, of Yukon at \$1 per share.

Boston.

Sept. 16.

(From Our Special Correspondent.)

Again what looked like a copper boom has been snuffed out. A week ago the Street was all agog with expectation that the much-heralded movement in copper shares was about to start. Many people were ready to venture on the speculative sea; but too many conflicting statements have been put out to suit the conservative, and so things have quieted down, and are back into the old rut again.

Notwithstanding this there is a decidedly better undertone to the market, and it would not be surprising if better prices were to be recorded before winter sets in. There is a persistent rumor that Amalgamated is to have a speculative whirl, and if such does come Boston coppers will certainly be affected sympathetically. The technical position of coppers as regards margined holdings is considered good. The bulk of stocks are owned outright, and tight money cannot affect these holdings. A much better feeling was manifest to-day, due to the large decrease in the foreign visible supply of copper. The continued strength of Calumet & Hecla is remarked as indicating the normal condition of copper. The price has fluctuated between \$550 and \$565.

United States Mining advanced to \$22.87 1/2 last week, and slid off to \$21.37 1/2, but floor brokers report that there is a steady demand for this stock all the time. A sale of 10 shares of Heinze's United Copper was made September 13 at \$34, which is the first sale for almost a month. Old Dominion lost \$2 to \$17 on the announcement that the mine would be closed down on account of a shortage of coke. Some satisfactory arrangement has got to be made with the railroad on rates, and this may prolong the shut-down. Mass Mining slipped off \$1.12 1/2 to \$17, but easily rallied to \$18. The mill is stamping 550 tons of rock per day. A selling movement in Santa Fe caused a fractional decline to \$1.75. The selling was done largely by two-dollar brokers.

Daly West has shown marked strength, and has been well bought up to \$53. There is a certain coterie of local enthusiasts in this stock who are great believers in the property. Mohawk holds steady around \$47. The final \$1 of the \$3 Victoria Mining assessment called last May is payable October 16. Wolverine holds firm around \$61. It is reported that about one-eighth of the total rock mined is being discarded. Very little is doing in Guanajuato, but the gross value of the ore last month was \$40,000,

which is its record month. Bingham has held steady around \$31.

Montana Coal and Coke is quoted around \$4. Construction work will end October 1, and earnings will then accrue to the stock. Many new improvements have been made which will make large savings. The company has 255 coke ovens in operation.

Colorado Springs, Sept. 12.

(From Our Special Correspondent.)

A decided change came over the market this week, both in the character and volume of trading, and many were inclined to believe that another boom had set in; but upon careful analysis of the situation it is easy to see what has caused the outbreak, and in a measure at least to gauge its strength and probable continuance. It is incorrect to call this week's improvement a boom; for it is just a natural reaction from the low prices that have prevailed for weeks and months past. And in this fact lies the future hope of the market.

The marked improvement was first noted on September 4, but had not gathered much headway to make it very noticeable. By September 9 things were running at high tide, since which date stocks have been adjusting themselves to the new order of things. Some have gone up, while others were not able to maintain the high prices to which the rush carried them. The mines list has been strengthening for some weeks, a little at a time; but it was not until September 6 that much improvement was noted in the remainder of the market, when, without warning, the preferred and common prospects caught the infection, and in one day 20 leading stocks of these departments advanced a clear 100 per cent.

Isabella sold from 37 down to 34c., recovering to 36½ @36c. to-day. Portland sold at \$2.20@2.25 on September 4 in the expectation that the directors would declare a dividend, but the impression grew out of a mistake, and the dividend matter will not be taken up until October 5. In consequence the shares went off this week, and sold down to \$1.92 yesterday, with \$1.90½ bid and \$1.94¼ asked to-day.

The gains of the week were made for the most part in the low-priced prospects, and are too numerous to chronicle separately, indicating that trading is of a highly speculative nature, which will turn to more legitimate trading later on.

Salt Lake City, Sept. 13.

(From Our Special Correspondent.)

The market has been steady during the week, with the balance leaning toward an advance. Sales were 229,147 shares. Some specials have had phenomenal moves, but as a whole the market has been most satisfactory from a buyer's viewpoint. Century, of Park Valley, and Lower Mammoth, of Tintic, have been the stars this week. Century opened at \$1.05, and rose steadily to \$1.26½ at the close, with 22,200 shares changing hands. Lower Mammoth opened at 84c. on Monday morning, and with reports of strikes and all kinds of ore coming in the workings advanced to \$1.51½ by the middle of the week, from which point it receded a little at the close; 27,200 shares were drawn from their holders at these prices. Uncle Sam did business to the extent of 15,500 shares at prices between .37½@.29. California registers sales amounting to 40,200 shares between 39½ and 35c., an advance of 5 to 6c. over last week. Eagle and Blue Bell advanced almost equal to the above mentioned stars, 1,300 shares selling at \$1.45@1.23, a climb over last week of about 30c. Daly West drops to \$50 per share, but as high as \$52.30 was paid during the week. Daly-Judge goes to \$12.10, with 1,185 shares sold.

San Francisco, Sept. 13.

(From Our Special Correspondent.)

The holiday this week interfered somewhat with business, and trading was light. There was no special break in prices, but the general range was lower.

Some quotations noted are: Consolidated California & Virginia, \$1.25; Ophir, \$1.25@1.20; Silver Hill, 55c.; Mexican, 37@38c.; Overman, 19c.; Potosi, 17c.; Gould & Curry, 12c.; Sierra Nevada, 11c.; Best & Belcher, 6@7c.

The sworn statements of the mining companies, on file in their offices, show cash on hand September 1, with all expenses paid, unless otherwise noted: Alta, \$10, with liabilities of \$2,480; Alpha Consolidated, \$145; Belcher, \$742, with liabilities of \$7,926 and August expenses partly unpaid; Best & Belcher, \$380, with liabilities of \$4,000 and bills payable of \$12,500 on mill purchase; Bullion, \$479; Caledonia, \$3,098, with August expenses unpaid; Challenge Consolidated, \$1,860; Consolidated Imperial, \$887; Confidence, \$4,031, with August expenses unpaid; Consolidated California & Virginia, \$16,712, with four cars of ore to be settled for; Chollar, \$587; Crown Point, \$3,544, with August expenses unpaid; Gould & Curry, \$8,104, with bills receivable of \$12,500 and liabilities of \$14,083; Justice, \$366, with liabilities of \$6,290; Mexican, \$2,892; Ophir, \$371, with four cars of ore to be settled for; Overman, \$3,767, with

August expenses unpaid; Potosi, \$953; Standard Consolidated, \$111,024, with August expenses and August clean-up of bullion to be settled for; Silver Hill, \$21,490; Sierra Nevada, \$1,561; Syndicate, \$2,105; Union Consolidated, \$3,715; Utah Consolidated, \$181.

The following companies in the above list have assessments in course of collection: Alta, Alpha Consolidated, Belcher, Best & Belcher, Justice, Sierra Nevada and Utah Consolidated.

On the Oil Exchange business was slow and sales comparatively few. The low-priced stocks were generally neglected. Hanford sold at \$87; Peerless, \$8.50; Kern, \$4; Home, \$2.90; Sterling, \$1.45; Twenty-eight, \$1.35; Junction, 16c.

The monthly record of sales on the Oil Exchange since January 1, 1902, is as follows:

Month—	Shares.	Value.
January	187,584	\$81,633
February	288,562	76,447
March	214,293	109,564
April	442,231	239,938
May	213,483	185,594
June	110,435	54,140
July	53,165	35,832
August	69,193	57,207
Total	1,578,946	\$840,355

The August business was only a little better than that of July.

London, Sept. 6.

(From Our Special Correspondent.)

The depression of the London mining market is quite exceptional. There is no speculation in any department, and the only transactions arise from the sale of holdings of deceased shareholders or of people who are gradually reducing their holdings in mines. The South African section is very much depressed, and an additional cause for uneasiness is the prospect of an indefinitely long political wrangle at the Cape, which will prevent the amicable settlement of racial differences.

In absence of interest in gold and copper shares, people have recently been watching with interest the movements in shares in home iron and steel companies. The report of Guest, Keen & Nettlefolds for the past year shows that that combination is amply justifying its existence and reflects great credit on the up-to-date business men connected with it. The Steel Company of Scotland in its report shows that the recent buying of British steel for American use was a very substantial market operation, for in this case the profit for the year was due entirely to the large American demand for ship-plates and structural steel. Another indication of the remodelling of the iron business is the closing of some of the works of the South Durham Company that are inland and the concentration of operations on the works on the coast. The shares in steel companies are not used in any way as speculative counters in this country, but are chiefly held by people who are desirous that local industries should flourish.

The Camp Bird Mine has now assumed a position in the London mining market, and quarterly reports have been commenced. The first issued covers the period from May 12 to August 12, and during this time the expenses are estimated at \$144,000, and the receipts from bullion concentrates and cyanides are \$446,000, so that a handsome profit has been earned. The developments also have been satisfactory and have opened up new bodies of high-grade ore. The shares have no very open market and are nominally quoted at about par. At the present rate of profit the shares should be decidedly valuable at par, and their inactivity is another of the anomalies of the mining market.

COAL TRADE REVIEW.

New York, Sept. 19.

ANTHRACITE.

Unless something utterly unforeseen happens the strike in the anthracite regions is not likely to last much longer. With the steady gains made by the operators of late the total output of the washeries and collieries may be 50,000 tons daily within 10 days, and when the output reaches that figure it will have a decided effect on the market. The output is already estimated as nearly 30,000 tons daily, and the amount of washery coal produced has lowered the price on steam sizes about \$1 per ton at New York Harbor points. In fact, more washery coal is being produced than is needed at New York Harbor, and we hear of shipments to places up the Hudson and other outside points. While little coal of the domestic sizes is sent out from the mines, yet the better supply of steam sizes will silence some of the New York City papers that have been reviling the operators and shouting "Mine coal!" They really cared little about the rights of either miners or operators, but did object mightily to high prices for steam fuel. Meantime the demand for the prepared sizes is increasing as people begin to get ready for colder weather. At the head of the lakes the docks are practically bare, perhaps 5,000 tons remaining of sizes in least demand. Consumers

of anthracite in the northwest this winter will have to rely on all-rail shipments. In Chicago territory there has been a decided increase in inquiries and more pressure on dealers; as a result retail prices have risen again. The outlook for large receipts by lake before navigation closes is not promising. At the lower lake ports, as at Chicago, there is a decided increase in the amount of soft coal used for domestic purposes, and sales of anthracite are very light. Along the Atlantic seaboard the market is quiet. At Philadelphia coal coming from the mines has so far been mostly for needy customers, though within the past few days conditions have improved, and steam sizes are more plentiful. At Boston there has been no material change in the situation, with nothing doing at wholesale. At New York Harbor points steam sizes are cheaper. We note the following retail prices for stove and nut sizes: Omaha, Neb., \$13; Bay City, Mich., \$7.25; Kalamazoo and Detroit, Mich., \$8.25; Chicago, \$12; Ashland, Wis., \$8.50; Elmira, N. Y., \$5.75; Boston, \$12; New York, \$12.50; Philadelphia, \$12.50; Baltimore, \$9; Savannah, \$7.50.

The story published by a New York City newspaper that the operators are to issue another schedule with higher prices for this winter was simply the effort of some ignorant or impudent reporter. When the miners are willing that the operators ship coal, it will sell at these figures f. o. b. New York Harbor shipping ports for free-burning white ash: Broken, \$4.25; egg, stove and nut, \$4.50. Buckwheat coal is now quoted as low as \$4 f. o. b. It has sold as high as \$6.

BITUMINOUS.

The Atlantic seaboard soft coal trade has shown no marked change during the week. Demand continues strong with the speculative price for Clearfield grades f. o. b. New York Harbor shipping ports, ranging around \$3.85@3.90. At these figures there is a considerable call for coal with a slight shortage in the supply. The railroads are trying to get forward all loaded cars lying on sidings along their lines, and coal is arriving pretty freely at the shipping ports. The market is taking all that arrives, however, and has not weakened to any extent. Labor troubles in the regions shipping to tidewater are practically cleaned up, only a few scattered strikes are reported, and these affect such a small tonnage that they have no appreciable effect on the Atlantic seaboard trade.

Demand in the far East is fair. People in that territory who previously used anthracite are taking considerable soft coal at speculative prices for this winter's need and thus increase the total demand. The chief endeavor of producers is to close up all ice-port contracts as soon as possible, and cargoes are sent forward whenever an opportunity offers. Along Long Island Sound coal is in short supply, and producers are trying to increase their shipments, but are unable to make any material gains on the demand. At New York Harbor points trade is easy, and consumers are cared for fairly well. All-rail trade shows a shortage of coal at certain points as some consumers have large supplies, and others are on a hand-to-mouth basis.

Transportation from mines to tidewater is fairly good, coal coming through quicker at the end than at the beginning of the week. Car supply has been poor much of the week, but has gradually improved, ranging from 40 to 75 per cent of the demand. In the coastwise vessel market small vessels are in short supply at the lower ports, while large vessels are in better supply. Freight rates have advanced slightly during the week, particularly from Chesapeake Bay ports. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound 60 @65c.; Boston, Salem and Portland 70c.; Wareham, Bath and Gardiner 75@80c., with towages from last port; Lynn, Newburyport, Saco and Bangor 85@95c. Rates from the farther lower ports are 15@20c. higher than above.

Birmingham, Sept. 15.

(From Our Special Correspondent.)

There is an excellent demand for coal, and with the exception of some petty troubles the mines are working well and are getting out a good production. Miners are still out at several smaller mines, where the operators did not feel able to pay the scale of the United Mine Workers, and at Coal City, in St. Clair County, a strike began the past week about some top work which will not last long. The Sloss-Sheffield Steel and Iron Company has at last commenced getting coal from its Flat Top Mountain mines in Walker County. Within the next two or three weeks coal will be shipped from the Davis Creek mines in Tuscaloosa County and Lehigh mines in Blount County. Other new mines in the State, specially those in Jefferson County, located near Bessemer, owned by the Alabama Steel and Wire Company, are being pushed, and will shortly be able to supply coal. The railroads are correcting the shortage of cars quickly, and it is believed that all needs will be met, though it is pretty hard work.

The Galloway Coal and Coke Company is making an opening in Bibb County in the vicinity of Brae-

head, on the Mobile & Ohio Railroad, and extensive development will be prosecuted in that vicinity. The Galloway Company has been producing much coal lately, having mines in Walker, Winston and Bibb counties. John R. Pill, general superintendent for the company, says that the company has a large number of orders on hand.

Chicago. Sept. 16.

(From Our Special Correspondent.)

Wholesale business in bituminous coal is good—too good, not a few dealers say. Office forces are working hard to keep up with the orders that come pouring in from city and country dealers, consequent upon the cold weather of the last week or two. The total lack of anthracite has led to a general rush on the part of retailers to lay in stocks of the better grade bituminous coals before the cold weather sets in in earnest. Thrashing coals are also still in good demand throughout the West. Smokeless coals maintain their supremacy as good sellers, and Hocking is in especially good demand. Retailers have advanced prices generally on bituminous coals, and are disposing of the shreds and patches remaining of the anthracite stock at \$12@15 a ton. Wholesalers are wholly without anthracite.

Pocahontas and New River smokeless have advanced to \$4@5 for run-of-mine; lump and egg of same grade sell for \$5@6. West Virginia splint has advanced from \$3.60 to \$4; Hocking (scarce) remains at \$3.35. Other grades remain about the same, Indiana block being \$2.70; Youghioghney lump, \$3.55; Brazil block, \$2.70; Indiana semi-block, \$2.10; West Virginia lump, \$3.47; Illinois coals, \$1.10@1.90 at the mines, plus freight to Chicago, 65c. to \$1 more. Blacksmith's coal is in good demand at \$3.50.

Cleveland. Sept. 17.

(From Our Special Correspondent.)

The week opened with all of the docks along the south shore of Lake Erie crowded with boats waiting for cargoes. Even small loads are scarce, and Milwaukee coal, which has been a rare article all summer, is now particularly scarce. Many of the grain-carrying boats and those which go to Escanaba for ore, which usually take up a large amount of coal, are running light. The smaller boats, however, require coal cargoes for ballast during the fall storms, and these are hanging about the docks waiting for loads. In order to meet this demand shippers have been making large demands upon the railroads for equipment which the latter have not been able to fill. There was a slight improvement in the supply of coal at the loading ports last week, but this disappeared at the beginning of the present week, and the shippers are again in straits for material. The absence of hard coal during the better part of the season and the continued scarcity of soft coal has deprived northwestern consumers of a very large portion of the needed material, and a famine in the Northwest is imminent. In the domestic market conditions are but a very little better. The railroad equipment has such an enormous demand upon it that there is no surplus on the Cleveland market, and prices are constantly increasing. The absence of anthracite coal and the slack movement of the bituminous product promises one of the hardest winters for coal supply in this territory that has been seen in years.

Pittsburg. Sept. 17.

(From Our Special Correspondent.)

Coal.—All quotations for bituminous coal this week are at 20 and 30c. above the circular prices or \$1.65@ \$1.75 a ton at the mine for 1½-in.; \$1.55@1.65 for ¾-in. and \$1.45@1.55 for run-of-mine. The supply of cars is better this week, but there is little improvement in transportation. Over 500 loaded cars remained in the different railroad yards in the district from Saturday until yesterday before they were moved to their destination. The Pittsburg Coal Company has made some large shipments to the lakes, and it is officially announced that the company will not be far behind in its northwestern contracts at the close of navigation. The Monongahela River Consolidated Coal and Coke Company now has loaded more than 12,000,000 bush., which may not get out before November or December. There are still a large number of empty boats and barges, and the mines will be kept in steady operation for over a month.

Connellsville Coke.—The heavy production continues, but unless there is a greater improvement in shipments this week there will likely be a falling off in tonnage. Prices continue firm, and premiums are still being offered for prompt shipment over the circular price of \$2.25@2.50 for furnace coke. The *Courier* in its last issue gives the production in the Connellsville Region for the previous week at 254,951 tons, a gain of 98 tons. The shipments for the week aggregated 11,676 cars, distributed as follows: To Pittsburg and river tipples, 4,099 cars; to points west of Pittsburg, 5,452 cars; to points east of Connellsville, 2,125 cars. This was an increase of 6 cars compared with the shipments of the previous week.

San Francisco. Sept. 13.

(Special Report of J. W. Harrison.)

During the week there have been 2 coal arrivals from British Columbia with 7,309 tons; 2 from Washington, 4,059 tons; 1 from Cardiff, 1,200 tons; 1 from Swansea, 3,148 tons; 1 from Newcastle, N. S. W., 5,600 tons; total, 21,312 tons. The quantity arriving this week is fully sufficient for all immediate demands. Jobbers report a very fair trade during the week, and the prices obtained are fully as high as those ruling last month. There are 6 cargoes of Australian coal, each out over 75 days, which makes them all fully due. As they have already passed out of first hands, their early arrival here will not disturb values. For domestic purposes, some few grades of Colonial coals have been generally tested, and are growing popular for family uses, among them Dudley and East Greta may be particularly mentioned. To demonstrate the further inroads being made by fuel oil into coal consumption, the California Central Gas and Electric Company has just completed gas plants at Fresno and Oakland, where 25 candle-power gas is being made successfully from fuel oil, and at a price fully 20 per cent less than same can be made from coal alone, besides being at least 5 candle-power higher. Freights from Australia and Great Britain on coal are still firm, which will materially reduce coal shipments from those sections.

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; Brymbo, \$7.50; Wallsend, \$7. Coke is \$15 per ton in bulk and \$17 in sacks.

Foreign Coal Trade. Sept. 18.

The export market here continues quiet, with very little new business reported.

Imports of fuel into Germany for the 7 months ending July 31 are reported as below in metric tons:

	1901.	1902.	Changes.
Coal	3,427,759	3,418,194	D. 9,565
Brown coal (lignite).....	4,690,162	4,450,655	D. 239,527
Coke	240,634	209,262	D. 31,372
Totals	8,358,555	8,078,091	D. 280,464

Of the imports this year 4,277 tons of coal were from the United States, which compares with 317 tons last year.

Exports of fuel from Germany for the 7 months ending July 31 are reported as below, in metric tons:

	1901.	1902.	Changes.
Coal	8,640,893	8,529,905	D. 110,988
Brown coal (lignite).....	12,968	11,678	D. 990
Coke	1,245,944	1,116,360	D. 129,584
Totals	9,899,805	9,657,943	D. 241,862

Included in the exports this year we find 5,913 tons of coke sent to the United States, an unusual shipment.

The Bavarian State Railroads have recently closed contracts for a year's supply of coal for 1903. The contracts cover 445,000 tons of coal from the Ruhr District, 32,000 tons from the Saar, 6,000 tons of brown coal (lignite) from Saxony, 160,000 tons of coal and 151,000 tons of lignite from Bohemia. The average price of the Ruhr and Saar coal is 14 marks (\$3.33) per metric ton, delivered on cars at Mannheim, which is equivalent to about 10.90 marks (\$2.69) at the collieries. The average price for the lignite is \$1.85 per ton.

Messrs. Hull, Blyth & Co., of London and Cardiff, under date of September 6, report that the Welsh coal market has shown a slightly easier tendency for large coals, smalls being firm. Quotations are: Best Welsh steam coal, \$3.90@3.96; seconds, \$3.78; thirds, \$3.60; dry coals, \$3.60; best Monmouthshire, \$3.36@ \$3.42; seconds, \$3.18; best small steam coal, \$2.04; seconds, \$1.56; other sorts, \$1.50.

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 2½ per cent discount.

The freight market to the Mediterranean is firmer, while the Eastern market is rather weaker. Some rates noted are: Marseilles, \$1.05; Genoa, \$1.14; Naples, \$1.14; Singapore, \$3.54; Las Palmas, \$1.38; St. Vincent, \$1.56; Rio Janeiro, \$2.88; Santos, \$3.12; Buenos Ayres, \$3.12.

IRON TRADE REVIEW.

NEW YORK, Sept. 18.

The pressing demand for pig iron and steel billets is being met by imports of foreign material. Foundries in the East are receiving iron from Great Britain and Germany; and foreign pig is being offered for

sale as far West as Chicago. Not only foundry iron is coming in; bessemer pig is also offered quite freely. The buying of foreign iron and steel, however, is all for early delivery, little or none being taken for future use. It is now practically impossible to place any orders with domestic makers for delivery earlier than the second or third quarter of next year.

Exports of iron from Germany for the 7 months ending July 31 are reported as follows, in metric tons:

	1901.	1902.	Changes.
Pig iron.....	67,938	162,667	I. 94,729
Other iron and steel.....	1,123,096	1,628,513	I. 505,417
Total	1,191,034	1,791,180	I. 600,146

Machinery is included in this statement. A considerable part of the increase in pig iron was shipments to the United States.

Birmingham. Sept. 15.

(From Our Special Correspondent.)

The regular quotations for pig iron for future delivery are somewhat stronger than they have been, and it is stated that sales, delivery next year, have been made at \$20 per ton for No. 1 foundry. Spot iron is selling right along—the little there is of it to be obtained at \$25 per ton. The larger companies in Alabama which made long contracts on iron at a price from \$5 to \$8 below the current figures are filling the last of these contracts, and the better prices will prevail. The furnace companies, except the few selling more on a spot market, are not anxious to get many orders ahead. The Republic Iron and Steel Company had a shortened production at their furnaces at Thomas during the past week, but the damage to the machinery has been repaired and all three furnaces will resume their big production immediately. This company is in need of all the iron that can be made at its furnaces.

The advance in pig iron freight rates goes into effect to-day, September 15. Some of the manufacturers have failed to cover themselves against the advance on shipments which have to be made in the near future.

The following quotations are given in this district: No 1 foundry, \$19@20; No. 2 foundry, \$18@19; No. 3 foundry, \$16.50@17; No. 4 foundry, \$15.50@16; gray forge, \$15.50@16; No 1 soft, \$19@20; No. 2 soft, \$18@19.

Work has commenced on the repairing of the Williamson furnace, a 75-ton blast iron furnace in the city, recently purchased by Frederick D. Dimnick, and the stack will be ready for operation in a short while. A report from Gadsden is to the effect that the new furnace of the Alabama Consolidated Coal and Iron Company is being pushed to completion, though it is not believed the furnace will be ready for operation until the first of next year. The Tennessee Coal, Iron and Railroad Company will have to reline Oxmoor furnace before it is ready for operation. The Valley Iron Company, which was organized a few weeks ago in this district, is preparing the site for its furnace and other works near Valley Head, between Birmingham and Chattanooga, Tenn.

Fluctuations in stock of the Sloss-Sheffield Steel and Iron Company recently caused much talk in Alabama, and there is a rumor that the big company is about to change control. This is denied by local stockholders. The company has seven furnaces in operation. In August, with six of these furnaces turning out pig iron, their production amounted to 28,000 tons. This month it is estimated it will be no less than 32,000 tons.

The report of the Southern Iron Committee for the month of August makes an excellent showing. Shipments of pig iron, steel and cast iron pipe from the Southern producing territory are strong and steady, and indications are that there will be no change for some time to come. The railroads are doing remarkably well in supplying cars with which to handle the product.

The demand for finished iron and steel shows no change and the plants in this district are working hard.

The strike of machinists, boiler makers and blacksmiths at several of the machine shops and foundries in the Birmingham District is still on. The men ask for eight hours to constitute a day's work, and this the proprietors will not grant.

Buffalo. Sept. 17.

(Special Report of Rogers, Brown & Co.)

The market situation in this district remains practically the same as outlined in our last weekly report. With but few exceptions the condition of blast furnace order books prohibit taking on further business for delivery during 1902, and several producers have taken all the orders they can comfortably handle up to July of next year. The labor troubles in the coalfields are still unsettled, and the supply of coke has been affected to such a degree that many foundries are greatly embarrassed. The market itself is very firm, but comparatively quiet. Consumption continues at a rapid rate. The following quotations are intended to approximate the prices being asked and paid for

what little iron is available for shipment during the balance of the present year. These are on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$27.75; No. 2, \$25.25.

Chicago. Sept. 16.

(From Our Special Correspondent.)

Foundry coke is not to be had for less than \$10@ \$15 now, with the greater part of sales probably made at \$12 or thereabouts. Furnace coke is almost out of the question; small shipments are being made from Connellsville westward, but not nearly enough to supply the needs of furnaces. The situation is a serious one for the makers and the users of pig iron and highly favorable to the foreign iron that is selling generally—almost universally—in the Chicago district, at \$25@ \$28. Northern remains at the same prices as last week; \$23.50@ \$24 for No. 1; \$23@ \$23.50 for No. 2, and \$22.50@ \$23 for No. 3. Southern is quoted at \$22.65@ \$24.65, Chicago, for No. 2, with No. 1 50c. higher and No. 2 50c. lower. The above prices are all for delivery after May 1 next year; for earlier delivery the buyer must pay a premium of \$3 to \$5. Sales are light compared with a month ago, though satisfactory to foundry proprietors in the present uncertainty about coke supply. Furnace-men who have stacks idle are dreading the continuance of the anthracite strike; it means heavy losses if orders cannot be filled.

Reports of schemes to use Western (bituminous) coals in making coke receive but little credence among iron and coal men. Too many such schemes have been announced before, to no other end than the drawing of dollars out of the pockets of credulous investors.

Cleveland. Sept. 17.

(From Our Special Correspondent.)

Iron Ore.—Cargoes from Escanaba are more plentiful this week than they have been for several weeks past, and the supply of ore at the head of the lakes continues to be good regardless of the fact that the stock piles are exhausted. The movement down the lakes is brisk, and further progress is made toward a large total for the season. It is apparent, however, that the immense shipment which was planned earlier may not be seen this year, because the shippers are inclined to withhold a large movement rather than pay excessive fall rates. The reason for this stand is that it seems likely now that the demand at the furnaces will not be as heavy this winter as has been supposed. Rates of carriage are: 75c. from Duluth, 65c. from Marquette and 60c. from Escanaba.

Pig Iron.—Importations of large amounts of pig iron into this territory will begin early in October, being the first since the great demand for pig iron appeared. Foreign No. 1, which runs between Domestic No. 1 and No. 2, is now selling on this market at between \$23.50 and \$25. No domestic quotation is made for this year's delivery, because the furnaces here have no material for sale. Valley furnaces have also stopped quoting for first half delivery. The future supply must come from new furnaces. Quotations of \$21 for No. 2, Valley furnace, are made for third quarter delivery of next year. Southern furnaces are quoting \$18@ \$20 for No. 2 at Birmingham for next year's delivery, having none for sale for this year. Basic pig producers have no iron for this year's delivery since the present production, due to the coke shortage, is largely off iron, and since all of the standard material produced hereafter will have to be applied on contracts. Bessemer producers withhold quotations for second quarter delivery of next year until it is known what per cent of the first quarter material will have to be delivered during the second quarter.

Finished Material.—Importations of bessemer billets are now being made on the basis of \$28 Pittsburg, which is underselling the home market by \$2. The large importation of this material is only prevented by the known inferior quality of the foreign material. The steel available at that price is having a tendency to replace the bars which have been quoted at \$32 Pittsburg and sold in lieu heretofore of billets under 4 by 4 in. Plate sales for next year's delivery continue at the standard price of 1.60c. Pittsburg until many of the larger mills are oversold for first half delivery. Spot sales are made at 2c. at the mill, and some material has been contracted at that figure for December and January shipment. Stock sales of structural shapes continue at the old quotation of 2.50@ 3c. Cleveland, the amount of material disposed of being limited to the supply at hand. A few mill sales are reported at 2.60c. at the mill, which brings the Cleveland quotation above 3c. Steel bars are well sold up for this year, with some buying for 1903 delivery at 1.60c. for bessemer and 1.70c., Pittsburg, for open-hearth. Bar iron mills are looking for business, and while they adhere to the 1.80c. Pittsburg quotation generally, it is understood that this price could be shaded should a good sized order put in its appearance. Sheets continue the one weak feature of the market, and the competition for business is very strong but without any serious break in the prices obtained. Black sheets are quoted at 3.35@ 3.50c.

out of stock for No. 27, with mill sales of the same gauge being made at 3.10@ 3.20c. Galvanized sheets are still weaker than the black, and the price holds feebly at 4.50c. for No. 27. Light rails for this year's delivery are bringing \$40, and a few orders have been taken for November delivery. Standard rails are sold well up into next year at \$28 with few transactions of late.

Philadelphia. Sept. 18.

(From Our Special Correspondent.)

Pig Iron.—Were it not for the arrivals of foreign pig iron in this market each week we would be in bad shape. The arrivals have been frequent enough and of sufficient magnitude to ease up apprehensions that existed three or four weeks ago. The importing interests keep their sales and prices secret, but the fact is pretty well established that about all the material that is wanted to tide us over can be had from foreign sources. Additional orders have just been placed for Middlesboro and Scotch iron with instructions to have deliveries made with the greatest possible dispatch. If there is any danger of scarcity it is found in No. 2 X foundry, the requirements of which appear to be growing rather than decreasing. Very little has been done in domestic foundry or forge iron this week. No satisfaction has been received by those who want bessemer pig, and it is understood that absolute requirements will be taken care of from time to time, although it is impossible at this time to make definite arrangements for later deliveries. Quotations may be safely given at \$24.50 for No. 1 X foundry; \$22.50 for No. 2 X; \$22 for No. 2 plain; \$21 for standard gray forge; basic is nominally \$21.

Steel Billets.—The assurance of supplies from abroad has lessened the anxiety among buyers. Careful inquiry develops the fact that requirements for the next few weeks are pretty well taken care of. Quotations are given to-day at \$27 for ordinary bessemer and \$28.50 to \$29 for open-hearth.

Merchant Bar.—Whatever is to be said as to the supply, it can be said that prices are stationary. Steel is selling at 2@ 2.20c., and deliveries are being made with a little more dispatch. Business is improving as to small orders, but is at a standstill as to large orders.

Sheet Iron.—Quotations range from 2.30 to 3.30c. The mill owners say they have the trade under better control.

Pipes and Tubes.—The report to-day is that inquiries are now being considered by some large interior mills for large quantities of pipe for late delivery.

Merchant Steel.—Agents of mills are unable to report any change in the situation.

Sklp Iron.—Managers of skelp mills report a strong market with no large orders at present.

Plate Iron.—Unexpected activity in plates developed since Monday mainly on orders from 200 tons to as high as 1,000. Small lots are quoted at 2.15, quarter in. sells as low as 2.05@ 2.10, universals 2@ 2.10, flange 2.10@ 2.15c.

Structural Material.—There is enough demand for quick deliveries to keep prices at premium rates. Quotations are given at about 2.40@ 2.50c. for quick delivery; agents say that prices on large lots for late delivery have not changed for a long time.

Rails.—It is stated that inquiries are still coming in for 1903 delivery.

Old Rails.—Old iron rails are quoted at \$25; steel rails \$22.

Scrap.—Large buyers of scrap are pretty well supplied, either by stock in hand or by contracts for future deliveries. It is a question whether all these contracts can be executed according to the terms made. A prominent scrap dealer says that the actual consumption of scrap is heavy enough to keep prices at top quotations. Steel scrap is quoted to-day at \$21; low phosphorus scrap at \$29.50; railroad scrap \$24.

Pittsburg. Sept. 17.

(From Our Special Correspondent.)

Production of pig iron continues to be considerably less than normal, the Valley furnaces being operated very irregularly, owing to the inability of the railroads to supply the coke needed. The greatest scarcity is in the bessemer and foundry grades, and none can be had from the furnaces before April. Middlemen are unable to accept large orders for early delivery, and some have been forced to import bessemer iron to fill contracts taken in expectation of obtaining all they would need to care for their trade from the furnaces. The shipments of coke from the Connellsville Region last week showed a slight improvement, and this week indications point to a better supply. The production continues to be heavier each week, but unless the railroads increase transportation facilities some of the ovens will have to be closed, as the yards are almost stocked to the limit. Despite promises of better coke shipments it now seems doubtful whether furnaces will soon be running to their full capacity.

Inquiries for foreign bessemer pig iron this week are unusually heavy, and it is reported that about 150,000 tons may be imported during the last quarter. If so large a tonnage is brought to this country it is doubtful if it could be delivered promptly by the railroads. The reports that the United States Steel Corporation has contracted for foreign iron, while not officially denied, cannot be confirmed. Failure to obtain deliveries of pig iron has curtailed the production of steel, and the demand continues to exceed the supply. High prices of bessemer iron have checked the decline in bessemer steel. There has been no marked improvement in the demand for finished material, and the mills have been enabled to catch up partly on urgent orders. Sheets and wire seem to be the only dull lines. The plate market is stronger than it has been at any time this year. The pool price is still quoted, but only for extended future delivery. For shipment within four months plates are held at a premium of \$5 a ton. It is estimated that fully one-third of next year's production of structural material has been contracted for, and imports are increasing. It is reported that about 2,000 tons a day are being brought in. No meeting of the beam association has been held for several months, and none is scheduled. There is, however, no probability of a change in prices for the coming year. The general outlook for 1903 in finished material is extremely satisfactory. There is a heavy demand, and all mills are well filled with orders. Shapes for early delivery cannot be obtained, and some building operation is being displayed in this city, owing to the inability to get deliveries on material ordered in February. Some cutting has been done in wire and wire nails, and low quotations have been made this week. Sales of wire nails in large lots to jobbers have been reported at \$1.97½ a keg, and desirable orders for plain wire have been accepted at \$1.90. These prices are said to represent an actual loss unless steel has been obtained at a specially low figure. The cause of the weakness in the market is attributed to the large surplus capacity.

Pig Iron.—The furnaces are entirely out of the market for bessemer and foundry iron, and it is not likely that new business will be accepted for delivery before the second quarter of next year. A few small sales are being made by middlemen. Some lots of bessemer pig iron for fourth quarter delivery have brought \$22, Valley furnaces, and even higher prices have been reported. A good Western order is noted being for shipment from November to April at \$21.85, Valley. For the first quarter of next year \$21.50 is mentioned. No. 2 foundry iron for early shipment is quoted at \$25, and sales for the first half have been made at \$22.50@ \$23, Pittsburg. Foundries in this district seem to be pretty well covered for this year. There continues to be a good supply of gray forge, but furnaces are holding it at \$21.50@ \$22, Pittsburg, for any delivery, an advance of 25c. a ton over the quotations of a week ago.

Steel.—The market is quiet. Bessemer billets remain at \$31, but sheet bars have advanced to \$33. Open-hearth sheet bars are held at \$32. There is no change in the market for foreign steel. Plates continue strong at 1.60c., the pool price, but a premium of \$5 a ton is paid for deliveries this year.

Sheets.—The market is very dull. Corrugated sheets are particularly weak, selling as low as \$1.90 a square for No. 28 gauge. Black sheets of No. 28 gauge remain at 3c., and galvanized sheets are selling at 70 to 75 and 5 per cent off.

Ferro-manganese.—No sales of domestic 80 per cent are recorded, and prices of the foreign product are lower, ranging from \$51.50 to \$52.25.

New York. Sept. 19.

Pig Iron.—One or two large sales of domestic iron at private terms are reported. Business for delivery before the end of the year is confined to foreign iron. We quote for 1903 delivery, Northern irons at tidewater: No. 1X foundry, \$23@ \$25.50; No. 2X, \$22@ \$23; No. 2 plain, \$21@ \$22. For Southern iron on dock, New York, No. 1 foundry, \$23@ \$23.50; No. 2, \$22@ \$22.50; No. 3, \$21@ \$22. Middlesboro pig is quoted at \$19.50.

Cast Iron Pipe.—For future delivery in large lots at tidewater 8-in. pipe is quoted at \$34.50.

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

Plates.—Deliveries can be had from Eastern mills a little more promptly. We quote for tidewater delivery in car-loads: Tank, ¼-in. heavier, 2@ 2.20c.; flange, 2.15@ 2.25c.; marine, 2.25@ 2.50c.; universal, 2@ 2.20c.

Steel Rails.—Standard sections are still quoted at \$28, f. o. b. mills for 1903 delivery; light rails, \$30@ \$35, according to weight.

Structural Material.—Premiums continue to be paid for small lots and prompt deliveries. We quote for

forward delivery at tidewater as follows: Beams and channels, 2@2.30c.; tees, 2@2.25c.; angles, 2@2.25c.

Cartagena, Spain. Aug. 30.

(Special Report of Barrington & Holt.)

The only shipment for the week was 3,000 tons dry ore to Great Britain, making a total of 228,480 tons to date. Business has been inactive owing to scarcity of tonnage. Iron ore rates are quite neglected; in fact, shippers who are pressed for boats have had to bring two steamers out in ballast from England in order to get their ore delivered at all promptly. On the other hand, there still continues a good deal of inquiry for both iron and manganiferous ores.

Quotations are per ton, f. o. b. shipping port: Ordinary 50 per cent iron ore, 6s. 6d. @ 6s. 9d.; special low phosphorus ore, 50 per cent iron, 7s. @ 7s. 6d.; special ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 6d.; specular ore, 58 per cent iron, 9s.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 6d. for lumps and 9s. 6d. for smalls. For manganiferous ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 3d.; No. 1 B, 25 iron and 17 manganese, 11s. 3d.; No. 2, 30 iron and 15 manganese, 10s. 3d.; No. 3, 35 iron and 12 manganese, 9s. 6d. All grades of manganiferous ores are rated at 11 per cent silicon and under 0.03 phosphorus.

Iron Pyrites.—Pyrites, 40 per cent iron and 43 per cent sulphur, are quoted at 11s. per ton, f. o. b. shipping port. No exports are reported for the week. Other exports were 42 tons ocher to Liverpool. Pyrites are in good demand for 1903 delivery, chiefly to Italy. A late sale is reported at 22 lire (\$4.25), c. i. f. Genoa, on basis of 43 per cent sulphur.

CHEMICALS AND MINERALS.

(See also wholesale prices-current on page 398.)

New York. Sept. 18.

Heavy Chemicals.—The consumptive demand is growing, and prices, with few exceptions, are steady. Some further contracts for forward shipments have also been booked at quotations below. Bleaching powder is unsettled. The combination which has existed between the United Alkali Company and Continental makers for the purpose of regulating prices by restricting the output of the respective brands, will terminate on December 31, 1902. From advices received it seems that the agreement has been more advantageous to Continental makers, particularly those of Germany and France, than for the British producers. Already competition is keen, and some large orders for 1903 delivery have been taken at considerably less than present quotations. According to reports sales have been made in Great Britain at £4 (\$20) a ton, less 2 1/2 per cent, delivered free at consumers' works. This leaves only about £3 10s. (\$17.40) at the producers' works in Liverpool, which is very nearly the cost of manufacture. Undoubtedly the cheaper electrolytic processes have inaugurated this price-war not only in foreign countries, but in the United States as well.

Domestic chemicals, we quote, per 100 lbs. f. o. b. works, as follows: High-test alkali, in bags, 82 1/2 @ 87 1/2 c., for prompt shipment, and 77 1/2 @ 85 c. for forward; caustic soda, high-test, \$1.90 @ \$1.95 for early delivery, and \$1.85 @ \$1.87 1/2 for futures; bicarb. soda, ordinary, \$1. and extra, \$3; sal soda, 65c.; chlorate of potash crystals, \$7.75. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90c. @ 92 1/2 c.; caustic soda, high-test, \$2.25; sal soda, 67 1/2 @ 74 c.; bicarb. soda, \$1.50 @ \$1.60; chlorate of potash, \$8.12 1/2 @ \$8.25; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60 @ \$1.65.

Alum.—Consumption is growing, and so is production, but stocks are light. In Ohio a new improved plant for the manufacture of alum and sulphate of alumina will be ready for operation early in October. Quotations for alum in wholesale lots, f. o. b. New York, are \$1.75 per 100 lbs. for lump, \$1.80 for ground and \$3 for powdered, while sulphate of alumina sells at \$1.15 @ \$1.25 per 100 lbs. for the commercial grades and \$1.50 @ \$2 for pure.

Acids.—A satisfactory business is being done in the commercial acids at unchanged prices.

The exports of copper sulphate from New York in August aggregated 304,661 lbs., valued at \$12,362, or \$4.05 per 100 lbs., which, compared with the same month last year, shows an increase of 129,351 lbs. in quantity, but the value per 100 lbs. has fallen 66c. In the 8 months ending August 31 the exports from this port were 23,269,092 lbs., against 37,140,258 lbs. in the corresponding period last year, showing a decrease of 13,871,166 lbs., or nearly 60 per cent in 1902. This depreciation in exports is due largely to the curtailed buying by Italy, which took only 14,614,634 lbs., or nearly 50 per cent less than last year. The average value of this year's exports was \$4.01 per 100 lbs., against \$4.59 last year, showing a falling off of 58c., due partly to competition abroad. 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:

Table listing prices for various chemicals: Blue vitriol, Muriatic, Nitric, Oxalic, Sulphuric, etc.

Brimstone.—Recent heavy arrivals have nearly all been taken at prices ranging from \$23 @ \$23.50 per ton for best unmixed seconds. Best thirds are worth \$1.50 per ton less. Shipments are stronger at \$22.50 @ \$22.75 for best unmixed seconds.

With regard to the market for brimstone in Sicily, Messrs. Emil Fog & Sons write from Messina, under date of September 1, as follows: The firmer tendency in our market has been increasing; nor could it be otherwise. We have repeatedly pointed out that, excepting about 5 per cent, the total existing stock of brimstone is owned by the Anglo-Sicilian Company. Of the new production actually under melting, 25 @ 20 per cent belongs to dissidents. But, owing to insufficiency of carriage means, engaged in preference in the transport of cereals, most of the newly melted brimstone remains at the mines, and the quantity arriving at seaboard is very limited. Abroad everybody seems imbued with the conviction that prices will fall considerably, and so were selling short. Instead of timely buying, when the syndicate was a willing seller, purchases were postponed till arrival of steamers, and opportunity was thus given for raising prices 1s. @ 2s. We quote, per ton, f. o. b.: Best unmixed seconds, 82s. 6d.; best thirds, 75s.; refined block sulphur, 86s. 6d.; refined roll sulphur in 3 cwt. casks, 97s. 3d.; sublimed flowers, pure, in bags, 99s. 6d.; sublimed flowers, current, in bags, 91s. 6d.

Owing to low coal freights from England to the Mediterranean freights to New York are 7s. 6d.; Portland, 7s. 9d.; Philadelphia and Baltimore, 8s; Baltic ports, 13s.

Pyrites.—A cargo of 3,559 tons Spanish pyrites was received by the Davis Sulphur Ore Company this week. Freight rates are steady, and if anything a little firmer at 10s. @ 10s. 6d. Business is seasonably good. Prices are unchanged.

Quotations are f. o. b. Mineral City, Va.: Lump ore, \$5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 13 @ 13 1/2 c. 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 market continues firm at \$3.05 per 100 lbs. for spot gas liquor, and \$3 @ \$3.02 1/2 for shipments up to the end of the year.

Nitrate of Soda.—Consumers are showing more interest, and considerable business has been done in a small way. Consequently the market is firmer for spot and nearby arrivals. Higher prices are looked for, as soon as the coal strike is settled, as the demand from this industry will then grow rapidly. As production of nitrate of soda in August was small, and as the European buying season is approaching, speculators are cheerfully anticipating a rise in the near future. Spot and this year's arrivals are quoted at \$1.90 per 100 lbs. Shipments in January, February and March, next year, are held firmly at \$1.87 1/2 @ \$1.90, and from April to December, inclusive, at \$1.82 1/2.

Concerning the statistical position of nitrate of soda in Europe, it is learned that the imports in the 8 months ending August 31 were 771,670 long tons; deliveries, 857,620 tons, and the visible supply on September 1, including stocks and cargoes afloat, 364,500 tons. Compared with last year the imports have decreased 121,000 tons, the deliveries have fallen off 133,370 tons, and the visible supply on September 1 has increased 29,570 tons. Business this year has been affected unfavorably by the high prices, and the unsettled condition of the beet sugar industry in Germany, which is the largest European consumer.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of July 26 as follows: Consumption has increased slightly. Producers have reduced their ideas considerably during the fortnight, and transactions have been effected for immediate loading at 6s. 1 1/2 d., and for November-December delivery even 5s. 11 1/2 d. has been accepted; but during the last few days 6s. 1/2 d. has been paid for November delivery and 5s. 11 1/2 d. for January-February, all ordinary terms. In 96 per cent transactions were made during the early part of the fortnight at 6s. 3d. alongside, for November-February delivery, but since then 6s. 1 1/2 d. has been accepted for January-March delivery. The production for the first 6 months of this year has been 13,792,000 qtls., against 13,413,000 qtls. for the same period in 1901, and the consumption 19,208,000 qtls. against 22,867,000 qtls. in 1901. We quote 95 per cent, 6s. 2d., July-August; 6s. 1 1/2 d., September-October; 6s. 1d. November-December, and 96 per cent, 6s. 5 1/2 d. August; 6s. 2d. November-December; all ordi-

nary terms sellers. The price of 6s. 2d. with an all-round freight of 18s. 6d. stands in 7s. 9 1/2 d. per cwt., net cost and freight, without purchasing commission. Reported sales are 482,000 qtls. and re-sales 27,000 qtls.

Phosphates.—Buying is still small, though exporters are aware that miners intend to keep up prices. Shipments on existing contracts are good.

Table showing phosphate prices: Per ton F. o. b. United Kingdom or European Ports. Columns for Phosphates, Per ton, Unit, Long ton.

Liverpool. Sept. 10.

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

Since our last attention has been principally devoted to the position of bleaching powder for 1903 delivery, while for prompt delivery there is a quiet but steady business passing in most lines of heavy chemicals.

Following are exports of bleaching powder and sodas for the month of August as per Board of Trade returns recently issued: Bleaching powder, to United States, 54,034 cwt.; other countries, 26,004; total, 80,038 cwt. Soda ash, 100,202 cwt.; caustic soda, 107,870; bicarb. soda, 30,841; soda crystals, 16,806; sodium sulphate, 51,488; other sorts, 25,885; total, 333,092 cwt.

These shipments compare very favorably with those for the corresponding month of last year. Soda ash, 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 are generally quoted at £3 7s. 6d. per ton, less 5 per cent for bbls., or 7s. less for bags, with special terms for certain export quarters. Caustic soda prices are firm, as follows: 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 very dull as regards fresh spot orders, although shipments on contracts continue heavy and hardwood is nominally quoted at £6 12s. 6d. @ £6 15s. per ton, net cash, with special quotations for the Continent and other export markets. For home trade requirements over 1903 a large business is reported on private terms, and very low prices are said to have been accepted. Manufacturers are now rather firmer in their ideas and talk of higher prices, but the position is still unsettled. Chlorate of potash is steady, at 3d. per lb. net cash, and makers have little to offer at the moment. Bicarb. soda is selling at £6 15s. per ton, less 2 1/2 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 still strong for prompt delivery, at £12 10s. @ £12 12s. 6d. per ton, less 2 1/2 per cent, is about nearest range for good gray, 24 @ 25 per cent in double bags, f. o. b. here. Nitrate of soda is rather firmer on spot, at £8 15s. @ £9 per ton, less 2 1/2 per cent, for double bags f. o. b. here, and there is a moderate business passing at the range.

METAL MARKET.

New York, Sept. 18.

GOLD AND SILVER.

Gold and Silver Exports and Imports. At all United States Ports in August and Year.

Table with 5 columns: Metal, 1901, August, 1902, 1901, Year, 1902. Rows for Gold Exports, Imports, Silver Exports, Imports, and Excess.

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 September 18, and for years from January 1:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...		\$27,912	\$450,616	\$22,176 E.	\$400,528
1902 ...	24,519,808	1,697,921	17,814,730	903,248 E.	35,733,299
1901 ...	25,808,029	2,269,793	22,919,116	2,759,757 E.	43,697,595
1900 ...	36,417,416	1,779,638	28,267,051	3,600,716 E.	59,304,164

Financial Notes of the Week.

The chief incident this week has been the pressure for money, caused by the heavy shipments of currency from New York. Temporary relief has been afforded by some pre-payments of October interest, made by the Treasury, and some \$7,000,000 gold is reported taken in Paris and London for shipment to New York. Some \$3,000,000 more is on the way from Australia.

Exports of merchandise from the United States in August were valued by the Bureau of Statistics of the Treasury Department at \$94,682,178, being \$5,875,321 greater than in July, but \$13,342,031 less than in August, 1901. For the 8 months ending August 31 the statement is as follows:

	1901.	1902.
Exports	\$939,329,341	\$821,685,198
Imports	679,650,756	614,165,387
Excess, exports.....	\$359,678,585	\$207,519,811
Add excess of exports, silver.....		14,501,397
Add excess of exports, gold.....		14,594,378
Apparent balance.....		\$236,615,566

The statement of gold and silver movement in detail will be found in the usual place, at the head of this column.

The statement of the New York banks, including the 59 banks represented in the Clearing House, for the week ending September 13, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts.....	\$825,830,600	\$872,266,100	\$899,498,900
Deposits	907,344,900	931,433,000	908,769,300
Circulation	29,478,000	30,796,100	34,267,500
Specie	176,600,800	167,955,700	155,775,300
Legal tenders.....	71,071,600	72,013,100	72,132,100
Total reserve.....	\$247,672,400	\$239,968,800	\$227,907,400
Legal requirements.....	226,835,225	232,858,250	227,192,325
Balance, surplus.....	\$20,837,175	\$7,110,550	\$715,075

Changes for the week, this year, was an increase of \$702,500 in circulation, decreases of \$6,875,900 in loans and discounts, \$14,628,900 in deposits, \$5,818,500 in specie, \$1,220,700 in legal tenders, and \$3,381,975 in surplus reserve.

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

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd.....	\$167,955,700	\$153,775,300		
England	195,645,970	187,729,365		
France	481,048,230	\$222,871,720	520,506,785	\$226,289,570
Germany	194,945,000	67,370,000	175,850,000	65,040,000
Spain	70,020,000	87,585,000	71,230,000	97,090,000
Neth'nds	31,254,000	27,765,000	25,708,000	32,837,500
Belgium	15,933,500	7,966,500	16,220,000	8,110,000
Italy	79,420,000	9,832,500	80,640,000	10,373,000
Russia	344,190,000	35,615,000	369,255,000	42,650,000

The return of the Associated Banks of New York are of date September 13 and the others September 11, 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.

Silver has been quiet but steady, and no new features appear. Buyers seem to succeed in getting their wants satisfied without advancing price.

The United States Assay Office in New York reports receipts of 143,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to September 4 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£5,322,910	£4,303,810	D. £1,019,100
China	525,512	135,850	D. 389,662
The Straits.....	81,526	178,120	I. 96,594
Totals	£5,929,948	£4,617,780	D. £1,312,168

Receipts this week were £188,000 from New York

and £40,000 from Australia; total, £228,000 in bar silver. Shipments were £88,250 to Bombay, £5,000 to Calcutta, and £2,500 to Colombo; total, £95,750.

Indian Exchange continues firm, and the Council bills offered in London were all taken at an average of 15.94d. per rupee. Buying of silver for Indian account continues very light.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$0.40 3/4	\$0.42
Peruvian soles and Chilean pesos.....	39 1/4	42
Victoria sovereigns.....	4.85	4.88
Twenty francs.....	3.85	3.88
Twenty marks.....	4.74	4.80
Spanish 25 pesetas.....	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

September	Silver		Copper				Spelter			
	Sterling Exchange	N. Y. Cts.	London Pence.	Lake Cts. per lb.	Electrolytic per lb.	London £ per ton.	Tin, cts. per lb.	Lead per lb.	N. Y. cts.	St. L. cts.
12	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25
13	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25
15	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25
16	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25
17	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25
18	4.85 1/4	51 1/4	23 3/4	11 7/8 @ 11 1/2	11 3/4 @ 11 1/4	53 1/2 @ 54	26 3/4 @ 27	4.05 @ 4.10	5.50	5.25

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 activity of last week has been followed by a reaction, which, under the circumstances, seems quite natural, and the market has been rather languid. Generally speaking, consumers do not appear to be covered far ahead, and are watching developments very closely. Quite some interest is being shown in distant deliveries. At the close we quote Lake copper at 11 3/4 @ 11 1/4 c.; electrolytic, in cakes, ingots and wirebars, at 11 1/2 @ 11 1/4 c.; in cathodes, at 11 1/4 @ 11 1/4 c.; casting copper, at 11 1/2 c.

The foreign market for standard copper opened last Friday at £53 5s., and on Thursday the closing quotations were cabled as £53 @ £53 2s. 6d. for spot, £53 5s. @ £53 7s. 6d. for three months.

Statistics for the first half of the current month show a decrease in the visible supplies of 2,400 tons.

Refined and manufactured sorts we quote: English tough, £55 10s. @ £56; best selected, £56 @ £56 10s.; strong sheets, £68 10s.; India sheets, £67; yellow metal, 6 3/4 d.

Exports of copper from Atlantic ports in the week ending September 17 are reported by our special correspondents as follows: Great Britain, 217 tons; Germany, 845; Holland, 996; France, 670; Italy, 51; Russia, 340; South Africa, 12; Philippines, 2; Brazil, 24; Argentina, 5; total, 3,162 tons. Imports were 1,012 tons copper, principally from Mexico, and 3,105 tons ore, mostly from Tilt Cove.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the producing companies, was as follows for August and the 8 months ending August 31, stated in long tons (2,240 lbs.) of fine copper:

	—August.—		—Eight months.—	
	1901.	1902.	1901.	1902.
U. S., reporting mines.....	19,267	23,196	150,646	163,693
U. S., outside sources.....	3,400	2,100	27,400	28,800
Total, U. S.....	22,667	25,296	178,046	192,493
Foreign reporting mines..	8,180	9,504	64,281	71,260
Totals	30,847	34,800	242,327	263,753
U. S. exports.....	6,840	12,429	61,691	122,128

The United States production shows an increase of 2,629 tons, or 11.6 per cent, for August, and of 14,447 tons, or 8.1 per cent, for the 8 months. The increase shown in August in the copper from reporting mines, and the decrease in that from outside sources, are due to the transfer of several mines, which had been included under the latter head, to the list of reporting mines. United States exports for the 8 months show an increase of 60,437 tons, or 97.9 per cent. The foreign reporting mines increased their output by 6,979 tons, or 10.9 per cent.

Imports and exports of copper in Germany for the 7 months ending July 31 are reported as below, in metric tons:

	1901.	1902.	Changes.
Imports	36,236	45,207	I. 8,971
Exports	2,640	2,792	I. 152
Balance	33,596	42,415	I. 8,819

The increase in the balance retained, which may be taken as representing approximately the consumption of foreign copper, was 25.8 per cent.

Tin has been very flat indeed, and has been selling at below the importation parity. At the close we quote September delivery at 26 1/2 @ 26 3/4 c.; October, 26 3/4 @ 26 1/2 c.

The London market closed last Friday at £123 5s., opened on Monday at £122 15s., and on Thursday the closing quotations were cabled at £121 10s. @ £121 12s. 6d. for spot, £118 2s. 6d. @ £118 5s. for 3 months.

Lead is in good demand, and prices are unchanged at 4 @ 4.05 c. St. Louis, 4.05 @ 4.10 c., New York.

The foreign market is somewhat firmer, Spanish lead being quoted at £10 18s. 9d. @ £11; English lead, 5s. higher.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of August 30 as follows: The price of silver during the week has been 13.25 reales per ounce. Exchange has gone down by 3 centimes, making it 34.44 pesetas to £1. The local quotation for pig lead on wharf has been 61.50 reales per quintal, which on above exchange is equal to £10 per ton of 2,240 lbs. f. o. b. Cartagena. Exports of pig lead have been 1,632,440 kgs. to London; 533,245 kgs. to Marseilles; 60,000 kgs. to Hamburg; making 2,225,685 kgs. in all.

Spelter.—The market continues very firm indeed. Prices are unchanged at 5 1/4 c. St. Louis, 5 1/2 c. New York.

The foreign market is firmer, good ordinaries being quoted at £19 7s. 6d., specials 5s. higher.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt, of Cartagena, Spain, write us under date of August 9 as follows: The price at the mines for zinc ores continues steady, and shows an upward tendency, in view of the higher price of spelter. Exports for the week were 2,150 tons of blende to Antwerp.

Antimony is dull. We quote Cookson's at 9 1/2 @ 9 3/4 c.; Hallett's, 7 3/4 @ 8 c.; Hungarian, Japanese, Italian and U. S. Star at 7 1/2 @ 7 3/4 c.

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

Platinum.—Consumption continues good, and prices are firm. 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 73 1/2 c. per gram.

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

	Per lb.	Per lb.
Alumtium.....		
No. 1, 99% ingots.....	33 @ 37c.	
No. 2, 90% ingots.....	31 @ 34c.	
Rolled sheets.....	4c. up	
Alum-bronze.....	20 @ 23c.	
Nickel-alum.....	33 @ 39c.	
Bismuth.....	\$1.50	
Chromium, pure (N.Y.).....	80c.	
Copper, red oxide.....	50c.	
Copper-molyb'dum (50%).....	\$1.25	
Ferro-titanium (10%).....	90c.	
Ferro-titanium (20 @ 25%, N. Y.).....	55c.	
Ferro-Tungsten (87%).....	28c.	
Magnesium.....	\$2.75	
Manganese, pure (N.Y.).....	60c.	
Mangan's Cop. (20% Mn).....	32c.	
Mangan's Cop. (30% Mn).....	38c.	
Molybdenum (Best).....	\$1.83	
Phosphorus.....	50c.	
American.....	70c.	
Ferro-molyb'dum (50%).....	50c.	
Sodium metal.....	50c.	
Tungsten (Best).....	62c.	

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

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.

Average Prices of Metals per lb., New York.

Month.	Tin.		Lead.		Spelter.	
	1902.	1901.	1902.	1901.	1902.	1901.
January	23.54	28.51	4.900	4.350	4.27	4.13
February	24.07	26.68	4.975	4.350	4.15	4.01
March	26.32	26.08	4.975	4.350	4.29	3.91
April	27.77	25.93	4.975	4.350	4.37	3.98
May	29.95	27.12	4.975	4.350	4.47	4.04
June	29.38	28.00	4.975	4.350	4.98	3.99
July	28.38	27.85	4.975	4.350	5.27	2.98
August	28.23	26.78	4.975	4.350	5.44	3.90
September	25.31	...	4.350	...	...	4.06
October	26.62	...	4.350	...	...	4.23
November	26.67	...	4.350	...	...	4.29
December	24.36	...	4.153	...	...	4.31
Year	26.54	...	4.354	...	...	4.06

forward delivery at tidewater as follows: Beams and channels, 2@2.30c.; tees, 2@2.25c.; angles, 2@2.25c.

Cartagena, Spain. Aug. 30.

(Special Report of Barrington & Holt.)

The only shipment for the week was 3,000 tons dry ore to Great Britain, making a total of 228,480 tons to date. Business has been inactive owing to scarcity of tonnage. Iron ore rates are quite neglected; in fact, shippers who are pressed for boats have had to bring two steamers out in ballast from England in order to get their ore delivered at all promptly. On the other hand, there still continues a good deal of inquiry for both iron and manganese ores.

Quotations are per ton, f. o. b. shipping port: Ordinary 50 per cent iron ore, 6s. 6d.@6s. 9d.; special low phosphorus ore, 50 per cent iron, 7s.@7s. 6d.; special ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 6d.; specular ore, 58 per cent iron, 9s.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 6d. for lumps and 9s. 6d. for smalls. For manganese ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 3d.; No. 1 B, 25 iron and 17 manganese, 11s. 3d.; No. 2, 30 iron and 15 manganese, 10s. 3d.; No. 3, 35 iron and 12 manganese, 9s. 6d. All grades of manganese ores are rated at 11 per cent silicon and under 0.03 phosphorus.

Iron Pyrites.—Pyrites, 40 per cent iron and 43 per cent sulphur, are quoted at 11s. per ton, f. o. b. shipping port. No exports are reported for the week. Other exports were 42 tons ocher to Liverpool. Pyrites are in good demand for 1903 delivery, chiefly to Italy. A late sale is reported at 22 lire (\$4.25), c. i. f. Genoa, on basis of 43 per cent sulphur.

CHEMICALS AND MINERALS.

(See also wholesale prices-current on page 398.)

New York. Sept. 18.

Heavy Chemicals.—The consumptive demand is growing, and prices, with few exceptions, are steady. Some further contracts for forward shipments have also been booked at quotations below. Bleaching powder is unsettled. The combination which has existed between the United Alkali Company and Continental makers for the purpose of regulating prices by restricting the output of the respective brands, will terminate on December 31, 1902. From advices received it seems that the agreement has been more advantageous to Continental makers, particularly those of Germany and France, than for the British producers. Already competition is keen, and some large orders for 1903 delivery have been taken at considerably less than present quotations. According to report sales have been made in Great Britain at £4 (\$20) a ton, less 2½ per cent, delivered free at consumers' works. This leaves only about £3 10s. (\$17.40) at the producers' works in Liverpool, which is very nearly the cost of manufacture. Undoubtedly the cheaper electrolytic processes have inaugurated this price-war not only in foreign countries, but in the United States as well.

Domestic chemicals, we quote, per 100 lbs. f. o. b. works, as follows: High-test alkali, in bags, 82½@87½c., for prompt shipment, and 77½c.@85c. for forward; caustic soda, high-test, \$1.90@\$1.95 for early delivery, and \$1.85@\$1.87½ for futures; bicarb. soda, ordinary, \$1. and extra, \$3; sal soda, 65c.; chlorate of potash crystals, \$7.75. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90c. @92½c.; caustic soda, high-test, \$2.25; sal soda, 67½c.@74c.; bicarb. soda, \$1.50@\$1.60; chlorate of potash, \$8.12½@\$8.25; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60@\$1.65.

Alum.—Consumption is growing, and so is production, but stocks are light. In Ohio a new improved plant for the manufacture of alum and sulphate of alumina will be ready for operation early in October. Quotations for alum in wholesale lots, f. o. b. New York, are \$1.75 per 100 lbs. for lump, \$1.80 for ground and \$3 for powdered, while sulphate of alumina sells at \$1.15@\$1.25 per 100 lbs. for the commercial grades and \$1.50@\$2 for pure.

Acids.—A satisfactory business is being done in the commercial acids at unchanged prices.

The exports of copper sulphate from New York in August aggregated 304,661 lbs., valued at \$12,362, or \$4.05 per 100 lbs., which, compared with the same month last year, shows an increase of 129,351 lbs. in quantity, but the value per 100 lbs. has fallen 66c. In the 8 months ending August 31 the exports from this port were 2,269,092 lbs., against 37,140,258 lbs. in the corresponding period last year, showing a decrease of 13,871,166 lbs., or nearly 60 per cent in 1902. This depreciation in exports is due largely to the curtailed buying by Italy, which took only 14,614,634 lbs., or nearly 50 per cent. less than last year. The average value of this year's exports was \$4.01 per 100 lbs., against \$4.59 last year, showing a falling off of 58c., due partly to competition abroad. Quotations per 100 lbs. are as below, unless other-

wise 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....	\$4.50@\$5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.	1.05
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, 60 deg.	1.20
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	bulk	21.00@23.00

Brimstone.—Recent heavy arrivals have nearly all been taken at prices ranging from \$23@\$23.50 per ton for best unmixed seconds. Best thirds are worth \$1.50 per ton less. Shipments are stronger at \$22.50 @ \$22.75 for best unmixed seconds.

With regard to the market for brimstone in Sicily, Messrs. Emil Fog & Sons write from Messina, under date of September 1, as follows: The firmer tendency in our market has been increasing; nor could it be otherwise. We have repeatedly pointed out that, excepting about 5 per cent, the total existing stock of brimstone is owned by the Anglo-Sicilian Company. Of the new production actually under melting, 25@20 per cent belongs to dissidents. But, owing to insufficiency of carriage means, engaged in preference in the transport of cereals, most of the newly melted brimstone remains at the mines, and the quantity arriving at seaboard is very limited. Abroad everybody seems imbued with the conviction that prices will fall considerably, and so were selling short. Instead of timely buying, when the syndicate was a willing seller, purchases were postponed till arrival of steamers, and opportunity was thus given for raising prices 1s.@2s. We quote, per ton, f. o. b.: Best unmixed seconds, 82s. 6d.; best thirds, 75s.; refined block sulphur, 86s. 6d.; refined roll sulphur in 3 cwt. casks, 97s. 3d.; sublimed flowers, pure, in bags, 99s. 6d.; sublimed flowers, current, in bags, 91s. 6d.

Owing to low coal freights from England to the Mediterranean freights to New York are 7s. 6d.; Portland, 7s. 9d.; Philadelphia and Baltimore, 8s; Baltic ports, 13s.

Pyrites.—A cargo of 3,559 tons Spanish pyrites was received by the Davis Sulphur Ore Company this week. Freight rates are steady, and if anything a little firmer at 10s.@10s. 6d. Business is seasonably good. Prices are unchanged.

Quotations are f. o. b. Mineral City, Va.: Lump ore, \$5 per ton, and fines 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 13@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 market continues firm at \$3.05 per 100 lbs. for spot gas liquor, and \$3@ \$3.02½ for shipments up to the end of the year.

Nitrate of Soda.—Consumers are showing more interest, and considerable business has been done in a small way. Consequently the market is firmer for spot and nearby arrivals. Higher prices are looked for, as soon as the coal strike is settled, as the demand from this industry will then grow rapidly. As production of nitrate of soda in August was small, and as the European buying season is approaching, speculators are cheerfully anticipating a rise in the near future. Spot and this year's arrivals are quoted at \$1.90 per 100 lbs. Shipments in January, February and March, next year, are held firmly at \$1.87½@ \$1.90, and from April to December, inclusive, at \$1.82½.

Concerning the statistical position of nitrate of soda in Europe, it is learned that the imports in the 8 months ending August 31 were 771,670 long tons; deliveries, 857,620 tons, and the visible supply on September 1, including stocks and cargoes afloat, 364,500 tons. Compared with last year the imports have decreased 121,000 tons, the deliveries have fallen off 133,370 tons, and the visible supply on September 1 has increased 29,570 tons. Business this year has been affected unfavorably by the high prices, and the unsettled condition of the beet sugar industry in Germany, which is the largest European consumer.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of July 26 as follows: Consumption has increased slightly. Producers have reduced their ideas considerably during the fortnight, and transactions have been effected for immediate loading at 6s. 1½d., and for November-December delivery even 5s. 11½d. has been accepted; but during the last few days 6s. ½d. has been paid for November delivery and 5s. 11½d. for January-February, all ordinary terms. In 96 per cent transactions were made during the early part of the fortnight at 6s. 3d. alongside, for November-February delivery, but since then 6s. 1½d. has been accepted for January-March delivery. The production for the first 6 months of this year has been 13,792,000 qtls., against 13,413,000 qtls. for the same period in 1901, and the consumption 19,208,000 qtls. against 22,867,000 qtls. in 1901. We quote 95 per cent, 6s. 2d., July-August; 6s. 1½d., September-October; 6s. 1d. November-December, and 96 per cent, 6s. 5½d. August; 6s. 2d. November-December; all ordi-

nary terms sellers. The price of 6s. 2d. with an all-round freight of 18s. 6d. stands in 7s. 9½d. per cwt., net cost and freight, without purchasing commission. Reported sales are 482,000 qtls. and re-sales 27,000 qtls.

Phosphates.—Buying is still small, though exporters are aware that miners intend to keep up prices. Shipments on existing contracts are good.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports.	
		Unit.	Long ton.
*Fla. hard rock (78@80%)	\$6.50@7.00	6¼@6¼d.	\$9.86@9.88
*Fla. land ph. (68@73%)	3.00@ 3.25	4¼@5d.	6.65@ 7.00
†Tenn., (78@82%) export	3.25@ 3.50	5½@6d.	8.58@ 9.36
†Tenn., 78% domestic	3.00	.....	.....
†Tenn., 75% domestic	2.75@ 3.00	.....	.....
†Tenn., 73@74% domestic	..@ 2.40	.....	.....
†Tenn., 70@72% domestic	2.10@ 2.25	.....	.....
‡So. Car. land rock	..@ 3.25	4½@5d.	5.67@ 6.30
‡So. Car. river rock	2.75@ 3.00	.....	.....
Algerian (63@68%)	.....	5½@6¼d.	7.15@ 8.13
Algerian (58@63%)	.....	5@5¼d.	6.00@ 6.80
Algerian (53@58%)	.....	4¼@5d.	5.32@ 5.58

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

Liverpool. Sept. 10.

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

Since our last attention has been principally devoted to the position of bleaching powder for 1903 delivery, while for prompt delivery there is a quiet but steady business passing in most lines of heavy chemicals.

Following are exports of bleaching powder and sodas for the month of August as per Board of Trade returns recently issued: Bleaching powder, to United States, 54,034 cwts; other countries, 26,004; total, 80,038 cwts. Soda ash, 100,202 cwts; caustic soda, 107,870; bicarb. soda, 30,841; soda crystals, 16,806; sodium sulphate, 51,488; other sorts, 25,885; total, 333,092 cwts.

These shipments compare very favorably with those for the corresponding month of last year. Soda ash, 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 are generally quoted at £3 7s. 6d. per ton, less 5 per cent for bbls., or 7s. less for bags, with special terms for certain export quarters. Caustic soda prices are firm, as follows: 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 very dull as regards fresh spot orders, although shipments on contracts continue heavy and hardwood is nominally quoted at £6 12s. 6d.@£6 15s. per ton, net cash, with special quotations for the Continent and other export markets. For home trade requirements over 1903 a large business is reported on private terms, and very low prices are said to have been accepted. Manufacturers are now rather firmer in their ideas and talk of higher prices, but the position is still unsettled. Chlorate of potash is steady, at 3d. per lb. net cash, and makers have little to offer at the moment. Bicarb. soda is selling 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 still strong for prompt delivery, and £12 10s.@£12 12s. 6d. per ton, less 2½ per cent, is about nearest range for good gray, 24@25 per cent in double bags, f. o. b. here. Nitrate of soda is rather firmer on spot, at £8 15s.@£9 per ton, less 2½ per cent, for double bags f. o. b. here, and there is a moderate business passing at the range.

METAL MARKET.

New York, Sept. 18.
GOLD AND SILVER.

Gold and Silver Exports and Imports.
At all United States Ports in August and Year.

Metal	August.		Year.	
	1901.	1902.	1901.	1902.
Gold:				
Exports....	\$150,861	\$2,395,414	\$32,517,345	\$30,465,690
Imports....	3,490,528	1,269,914	23,494,611	15,871,612
Excess. I. *	\$2,339,667	E. \$1,035,500	E. \$9,022,596	E. \$14,594,378
Silver:				
Exports....	\$4,398,497	\$4,741,968	\$36,653,246	\$30,941,816
Imports....	2,598,578	1,763,134	20,295,917	16,440,419
Excess. E. †	\$1,781,919	E. \$2,978,834	E. \$16,357,329	E. \$14,501,397

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

Average Prices of Copper.

Table with columns: Month, New York (Electrolytic, Lake, London Standard), 1902, 1901. Rows: January to December, Year.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Table with columns: Month, London, N. Y., 1902, 1901. Rows: January to December, Year.

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

DIVIDENDS.

Table with columns: Name of Company, Date, Share, Total, Per, Total to Date. Lists various companies and their dividend details.

*Monthly. †Monthly. §Semi-annual.

ASSESSMENTS.

Table with columns: Name of Company, Location No., Delinq., Sale, Amt. Lists companies and their assessment details.

STOCK QUOTATIONS.

NEW YORK.

Table with columns: Company and Location, par, Sept. 11, Sept. 12, Sept. 13, Sept. 15, Sept. 16, Sept. 17, Sales. Lists various stock prices.

†Assessment Paid.

Coal, Iron and Industrial Stocks.

Table with columns: Company, par, Sept. 11, Sept. 12, Sept. 13, Sept. 15, Sept. 16, Sept. 17, Sales. Lists coal, iron, and industrial stock prices.

Total sales, 300,923 shares.

BOSTON, MASS.*

Table with columns: Name of Company, par, Shares listed, Sept. 11, Sept. 12, Sept. 13, Sept. 15, Sept. 16, Sept. 17, Sales. Lists Boston stock prices.

Total sales, 48,789 shares.

PHILADELPHIA, PA. §

Table with columns: Name and Location of Company, par, Sept. 11, Sept. 12, Sept. 13, Sept. 15, Sept. 16, Sept. 17, Sales. Lists Philadelphia stock prices.

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 13,242 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Anaconda, etc., with columns for par value, Sept. 8-13, and sales.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 1,202,250 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs (By Telegraph) listing companies like Acacia, Alamo, Anaconda, etc., with columns for par value, Sept. 11-17, and sales.

MEXICO.

Sept. 13.

Table of stock quotations for Mexico listing companies like Durango, Guanajuato, Angustias, etc., with columns for shares, par value, bid, ask, and price.

ST. LOUIS, MO.* Sept. 13.

Table of stock quotations for St. Louis, Mo. listing companies like Am. Nettie, Catherine Lead, etc., with columns for shares, par value, bid, ask, and price.

TORONTO, ONT. Sept. 16.

Table of stock quotations for Toronto, Ont. listing companies like Center Star, Fairview, Lone Pine, etc., with columns for par value, high, low, and sales.

*From our Special Correspondent.

Total sales, 38,500 shares. † Ex-Dividend.

LONDON.

Sept. 6.

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. 28.

Table of stock quotations for Paris listing companies like Acieries de Creusot, Firming, Huma-Bank, etc., with columns for country, product, capital stock, par value, latest divs, and prices.

SALT LAKE CITY.* Sept. 13.

Table of stock quotations for Salt Lake City listing companies like Ajax, Ben Butler, Bullion-Beck, etc., with columns for shares, par value, high, low, and sales.

SPOKANE, WASH.* Sept. 12

Table of stock quotations for Spokane, Wash. listing companies like American Boy, Ben Hur, Black Trail, etc., with columns for par value, high, low, and sales.

All mines are in Utah. *By our Special Correspondent. Total sales, 197,597 shares.

Total sales 44,150 shares. *Reported by Hunner & Harris.

